

A SHORT  
COMMERCIAL  
GEOGRAPHY

BY  
LIONEL W. LYDE,  
M A., F R G S.  
PROFESSOR OF ECONOMIC GEOGRAPHY IN UNIVERSITY COLLEGE,  
LONDON

*FIFTH EDITION*  
*(COMPLETING TWENTY-ONE THOUSAND)*  
*WITH STATISTICAL APPENDIX*

A & C. BLACK, LTD.  
4, 5 AND 6 SOHO SQUARE, LONDON, W. 1.

1919



First Edition, published March 1903,  
Second Edition, October 1906, Third Edition, June 1910;  
Fourth Edition, February 1915, Reprinted, July 1916;  
Fifth Edition, September 1919

## PREFACE.

GEOGRAPHY is a study of the earth from the standpoint of Man, and Commercial Geography is simply that part of the Science which is specially concerned with Man's wants. That is to say, it is a study of the earth from the standpoint of the intelligent merchant, who wishes to know where he can get the largest amount of the usual commodities, in the best condition, at the least cost, and with the greatest regularity.

The essential point is a thorough knowledge of the typical conditions under which the commodities are, or may be, produced; and it is the office of Commercial Geography to supply this knowledge.

It is a cause for regret, therefore, that in various ways Commercial Geography has been either made a matter of 'cram,' or confused with Political Economy and Commerce. Knowledge of the theory of exchange and of actual commercial operations is of infinite value in actual business; but neither the one nor the other has, I think, any direct place in a text-book of Commercial Geography.



If this conception of the Science is correct, it is obvious that variable statistics and similar burdens on, or appeals to, the memory should be avoided; and that the typical conditions for the production of necessities should be emphasised. And the Science can be called truly educational only if it leaves much to the initiative and co-operation of the student, simply providing a basis for ascertained facts and generalisations and for analysing the true relations of ordinary economic phenomena.

I have tried to emphasise only what will develop mental power, *e.g.* argument by 'cause and effect,' and will involve students in such useful processes as observation, *e.g.* on the map—selection of essentials, *e.g.* in making their own summaries (of imports, exports, etc.)—and verification of facts, *e.g.* from official or other trustworthy statistics.

A Statistical Appendix has been added to this (the fifth) edition, with the object of indicating the results of the last five years and of supplying some trustworthy statistics on some points on which they may be difficult to procure just at present.

L. W. L.

## CONTENTS.

INTRODUCTORY—	PAGE
Some Physical Features, - - - - -	1
Climate, - - - - -	5
Population, - - - - -	8
Some Commodities, - - - - -	11
Trade Routes, - - - - -	19
 EUROPE—	
British Isles, - - - - -	23
General Features of the Continent, - - - - -	40
France, - - - - -	47
Belgium, - - - - -	53
Holland, - - - - -	57
Scandinavia, - - - - -	60
Denmark, - - - - -	63
Russia, - - - - -	65
Germany, - - - - -	70
Austria-Hungary, - - - - -	78
Switzerland, - - - - -	84
Italy, - - - - -	87
Iberian Peninsula, - - - - -	93
Balkan Peninsula, - - - - -	98
 NORTH AMERICA—	
General Features, - - - - -	103
Canada, - - - - -	118
Newfoundland and the Bermudas, - - - - -	130
United States, - - - - -	134
Mexico, - - - - -	150
Central America, - - - - -	154
West Indies, - - - - -	158

SOUTH AMERICA—		PAGE
General Features,	- - -	165
Western States,	- - -	170
Eastern States,	- - -	177
ASIA—		
General Features,	- - -	185
Turkey-in-Asia,	- - -	190
The Iran Plateau,	- - -	194
India,	- - -	196
'Indian' Islands,	- - -	205
Indo-China,	- - -	206
Japan,	- - -	208
China,	- - -	212
Russia-in-Asia,	- - -	219
East Indies,	- - -	222
AFRICA—		
General Features,	- - -	225
Northern Countries,	- - -	234
Central „	- - -	241
Southern „	- - -	248
African Islands,	- - -	256
AUSTRALASIA—		
Australia, -	- - -	259
Tasmania,	- - -	266
New Zealand,	- - -	267
Pacific Islands,	- - -	270

## MAPS.

THE WORLD, -	- - -	20
BRITISH ISLES,	- - -	39
CENTRAL AND SOUTHERN EUROPE,	- - -	56
NORTH AMERICA (Transcontinental Railways),	- - -	133
SOUTH AMERICA (Chief Railways),	- - -	164
NORTHERN ASIA,	- - -	184
SOUTH AFRICA (with 'Cape to Cairo' Route),	- - -	224
AUSTRALASIA,	- - -	257

# A SHORT COMMERCIAL GEOGRAPHY.

## INTRODUCTORY.

### Some Physical Features.

1. THE primary division of the earth's surface is into land and water, the water covering nearly three-quarters of the whole area.

1. The relation of the two decides the distribution of all forms of life upon the earth, and this relation is effected through the atmosphere, by which the vapour drawn up by the sun from the water is carried over the land to be precipitated—mainly through the influence of mountains

2. Mountains are due chiefly to the subsidence of large areas, and the consequent elevation of narrow bands, of the earth's crust

1. As the earliest subsidences and elevations were naturally the most gentle, the oldest ocean—the Indian—is the shallowest, and the youngest mountains—the Himalayas, Andes, Caucasus, and Rockies—are the highest

2. The character of the material of which mountains are made, greatly affects their commercial value, the older and harder rock, *eg* 'Primary,' usually contains great mineral wealth, while the younger and softer, *eg* 'Tertiary,' makes the most fertile soil

3. Mountains have many uses—climatic, political, and commercial.

1. For instance, they keep off winds, 'attract' clouds, and form sites for sanatoria in the Tropics. Thus, the Scandinavian

Mountains exclude the mild S.W. anti-Trade winds from Sweden, as the Rockies exclude the bitter N winds from British Columbia, the Apennines shelter the vineyards of Naples from the N.E., as the Alleghenies shelter the orange-groves of Carolina from the N.W.

When winds saturated with moisture are forced—rising to cross mountains—up into colder strata of air, the moisture is condensed, and heat is freed; and this rising heat draws in clouds, to be similarly condensed. Thus, the Himalayas indirectly 'attract' the S.W. monsoons to the source of the Brahmaputra and the Indus, as the Andes 'attract' the Trade winds to the source of the Amazon and the Orinoco.

Generally speaking, both temperature and humidity diminish with height; and, as it is the damp heat that makes Tropical climates so unhealthy for Europeans, the mountains provide suitable summer stations, e.g. Simla, Darjiling, Utakamand.

2. Politically, mountains affect questions of national frontier, national existence, and national character. Thus, the absence of mountains where Kelt and Teuton meet, has caused the mixture of race and language which has rendered the government of Belgium so difficult, especially in regard to education, and has made its S.W. frontier "the battlefield of Europe," cf. Steinkirk and Landen, Ramillies and Oudenarde, Quatre-bras and Waterloo.

Besides forming a more or less definite frontier, mountains also encourage and defend independent national existence. The Scandinavian mountains were responsible for the difficulty experienced in governing Norway from Stockholm, as the Cambrian Mountains were for that experienced in conquering Wales, the Alps have done for the Swiss what the Grampians did for the Gaels; "Africa begins at the *Pyrenees*."

Spain also shows the effect of mountains on national character. It is a compact series of deep valleys isolated from one another by chains of barren and inaccessible mountains; the rich valley pastures and the barren cave-riddled mountains have made it the land of bull-fights and banditti. In a bleaker climate and under a different creed the similar valleys of Scotland and Wales have enriched the world with many a psalm and many a soldier.

- 3 Commercially, mountains are useful as the source of water and water-power, the natural home of mineral wealth, and the natural site for 'temperate' forests and pasture. Thus,

the Massachusetts ('Great Hills') have done for the New England States what the Pennines have done for Lancashire and Yorkshire, the Chaudière Falls are as useful to the saw-mills of Ottawa as the St Anthony Falls are to the flour-mills of Minneapolis, glaciers, which in Norway are merely sources of ice for the fish trade, would in Australia be an inestimable blessing as a guarantee against drought. Cf the irrigated vegetation of the Atacama 'Desert.'

The rain which feeds these watersheds, washes the soil off the face of the mountains, and thus lays bare minerals. In this way, copper was laid bare on the windward side of the Chilian Andes, tin on the windward side of Tasmania, and gold on the windward side of the New Zealand Alps.

On this wet windward side also spring up magnificent forests, *e.g.* in British Columbia, Norway, and on the Western Ghats, while on the dry leeward side there is equally magnificent pasture, cf the Victorian wool, Canterbury lamb, Swiss milk.

4. Mountains should be carefully compared with plains, *e.g.* the Himalayas with the plain of Hindustan. It will be found that mountains concentrate a great variety of climate, scenery, etc., within a very small area, while plains spread a uniform climate, monotonous scenery, etc., over a very wide area. They also, of course, give all the facilities for cultivation and transport which mountains do not give, they have, therefore, always been a temptation to invaders from barren highlands, and have offered no obstacle to invasion.

4 Rivers have no importance climatically, and—in modern times—not much politically, but their commercial importance is very great.

1. Rivers are important commercially because they are the chief agents in removing soil from highlands to lowlands, they drive all kinds of machinery, and they provide transport. Thus, "Egypt is the gift of the Nile," as Holland is the gift of the Rhine, the mechanical power of Niagara is as valuable to the mills of Buffalo as that of the Murray is to the irrigation works of New South Wales and Victoria, and the value of transport may be gauged by a comparison of the city-girt banks of rivers like the Ganges or the St. Lawrence or the Danube with the deserted banks of rivers like the Indus, the Orange, the Clutha. Obviously, the value of a river for transport depends on its freedom from rapids, from ice, from a bar, from a terrific current, from great variation in depth and volume.

## INTRODUCTORY.

Rivers have also occasionally direct commercial value in the production of some commodity. Thus, the absence of lime-salts from the soil of Flanders makes the water of the Lys peculiarly adapted to the cleansing of flax, as that of the Rhone at Lyons is for dyeing silk, and that of the Maine (U.S.A.) rivers is for manufacturing pulp and paper. So, the presence of gypsum in the bed of the Trent helped to make Burton famous for beer.

2. Politically, rivers make good boundaries, and attract population. For instance, the Plate has made a splendid political boundary between the Argentine and Uruguay, Paraguay and Bolivia, as the Orange is between the Orange Free State and the Cape of Good Hope, and as the Thames is between the counties along its north and south banks.

The attraction of people to rivers involves commercial questions of food and communication, but becomes important politically when the particular country is too long (for its width) to be easily governed from a single centre, or when it is very much isolated by natural barriers of mountain or desert. Thus, Egypt is naturally divided into two parts—the Nile valley and the Delta (the old kings even wore *two* crowns), and the difficulty of governing such a long, narrow, desert-girt strip from a single place gave great political importance to the Nile, and led to great rivalry between Thebes (valley), Alexandria (Delta), and Cairo (middle). So, the fact that Austria-Hungary was shut in by mountains everywhere except where the Danube enters and leaves the country, made the river very important politically as well as commercially.

The connection between the two is illustrated, in modern times, by the 'riverside' routes of railways, and, less recently, by the sites of great battles. Thus, the *London and North-Western Railway* climbs Shap Fell by the Lune and Eden valleys, as the *Canadian Pacific Railway* climbs the Rockies by the Bow and the Fraser valleys; Majuba Hill, Rorke's Drift, and Isandhlana are to the Buffalo River what Khartum, Omdurman, and Atbara are to the Nile, and what Mons, Jemmappes, and Fontenoy are to the Scheldt.

3. The importance of a river-system may be greatly increased if it includes any lakes, for a lake acts as a reservoir, a filter, a check on floods, an additional aid to transport, and even as a moderator of climate. As a reservoir, the Alpine type of lake—long, deep, and narrow, e.g. Geneva or Tanganyika—is more useful than broad shallow lakes like Ladoga or Victoria Nyanza, partly because it is generally at

a greater altitude, and partly because it exposes a much smaller proportion of its volume to evaporation, it is also the more useful for transport, because it stretches over a relatively longer distance.

Lakes are almost equally, if less obviously, important as filters, checks on floods, and moderators of climate. Thus, it is entirely due to the filtering through the Great Lakes that the St. Lawrence does not bring down enough mud to deposit a delta or even a bar at its mouth, the heaviest flood being dissipated within a mile from its point of entry to the lakes; and their climatic influence is seen in the heavy snow-fall of Ontario, the dense timber of the Michigan peninsula, and the regular 'land and sea' breezes, especially round Lake Superior.

### Climate.

1. Climate decides the distribution of animal and vegetable life, and these two forms of life are closely connected, especially in the case of uncivilized nations.

1. Climate must be distinguished from weather. The latter is the particular amount of heat, moisture, and wind in a particular place at a particular time; climate is the sum of the average conditions which make a place suitable or unsuitable for animal or vegetable life.

2 It is determined by heat, moisture, and wind.

1. The heat depends mainly on latitude and height, and the latitudes of greatest heat produce the greatest abundance of plant and animal life, and, as man's wants, *e.g.* for food and shelter, are fewest and most easily satisfied in these hot latitudes, there ought to be surplus products for export to less favoured latitudes.

2. The moisture depends mainly on distance from large areas of water and the direction of the prevailing wind.

3. The wind itself depends on inequalities of temperature, which produce inequalities of atmospheric pressure; and the movements necessary to equalize these inequalities form currents of air.

3. The relation of heat to latitude is a question of direct sun influence, not of the influence of water or wind in transferring heat from a low latitude to a higher.



1. The rotation of the earth on its axis causes daily changes of temperature, which are most felt in the Tropics; the revolution of the earth round the sun causes seasonal changes of temperature, which are most felt in the Polar regions. For instance, the difference between summer and winter temperature in the north of Newfoundland is sometimes  $50^{\circ}$ , in the south of Ceylon it is seldom more than  $5^{\circ}$ .
  2. As the earth is nearest to the sun ('in perihelion') during the 'southern' summer, the sun's rays are hotter south of the Equator than north of it; and this helps to account for the intense heat of the Australian summer.
  3. The sun's rays are warmer in low latitudes than in high latitudes because they are more concentrated, and because they pass through less atmosphere; and, as the rays fall on the earth obliquely in all latitudes when the sun is low down on the horizon, the morning and evening rays have often to pierce such a dense atmosphere that only the long waves of *red* light ever shine through.
  4. The length of the day also varies with the latitude, and the long duration of sunlight in high latitudes during summer leaves very little time for radiation of heat at night. *e.g.*, at Klondyke there are about 20 hours of daylight at mid-summer. Of course, the mid-winter night is correspondingly long; but the snow helps to lessen the darkness and to keep the soil warm, though it is such a bad conductor of heat that it may delay the coming of spring by keeping the surface 'below freezing-point' until it is all melted.
  5. In high latitudes the earth is so small in circumference that it is rotating very slowly; and therefore the sun's rays pass very slowly over any given area of land.
4. Variations in height show exactly the same climatic changes as variations in latitude.
1. The peaks of high mountains are capped with 'Polar' snow, and their sides are covered with belts of vegetation, varying with the height. For instance, Mount Everest is covered with snow for *a mile* downwards from its crest, and has a Tropical jungle at its base, with 'Temperate' vegetation in between.
  2. The slope also causes the sun's rays to fall more directly upon the surface, which accounts, *e.g.*, for the practice of planting fruit trees on a 'southern aspect' in England, but on a 'northern aspect' in New Zealand.

3. Mountains also, incidentally, shelter the valleys and plains below them Cf the Riviera

5 The importance of large areas of water is due to the fact that they are the source of all rain and the great moderators of climate, in addition to providing various kinds of food, *e.g.* fish and salt.

1. The sun's rays heat only the surface of land, but can penetrate water to a depth of probably 500 feet; water has also high specific heat, and much heat is rendered latent during evaporation. Consequently, surface water does not become warm with the same rapidity or to the same degree as land does, nor does deep water radiate heat as quickly or as completely as land. Thus, water tends to raise temperature at night and in winter, and to lower it by day and in summer. For instance, Glasgow is much warmer in winter and much cooler in summer than Moscow, which is in the same latitude.
2. The oceans also contain currents of cold and warm water, which further moderate the climate; and the warm currents have special relation to rainfall. Thus, the cold Labrador current helps naturally to keep land in the latitude of Iceland frozen up for 4 or 5 months every year, while the Gulf "Drift" facilitates the ripening of barley in Norway inside the Arctic circle, and the precipitation in Norway is at least twice as heavy as in Labrador.

6 The transferred heat and the vapour off these warm currents are distributed by the winds.

1. The Earth is always surrounded by two belts of high atmospheric pressure, the one about  $35^{\circ}$  N. and the other about  $30^{\circ}$  S.—the 'Horse Latitudes'. From these areas of high pressure the air is always moving to areas of low pressure, which are found both at the Equator and at the Poles; but in neither direction can this movement be due north or south. The Earth is spinning so fast at the Equator that the 'Trade-winds' are left behind, and seem to be deflected towards the west; it is spinning so slowly in the Polar regions that the 'Anti-Trades' get ahead of it, and seem to be deflected towards the east.
2. As winds move from a colder to a warmer latitude, they can usually carry more vapour than they can pick up; thus, *e.g.* in the Tropics, both the NE and SE Trades are remarkably steady, and the great evaporation causes the

surface water to be intensely salt. Precisely the opposite is true of the Anti-Trades, but as the *NW* Anti-Trades blow over much the larger area of sea, they are both steadier—'Brave West Winds'—and wetter than the *S.W.*

The direction of these regular winds accounts, *e.g.*, for the fact that in the Tropics east coasts are rainy and deserts are to the west, while outside the Tropics west coasts are rainy and deserts are to the east. So, too, outside the Tropics the fashionable quarter of towns is the 'West End,' *i.e.* to windward, inside the Tropics the 'West End' is the quarter to which the Easterly Trades carry all the smoke and smells, and therefore the 'East End' is the more fashionable quarter.

3. As land heats and cools more quickly than water, it will have over it relatively cooler air, *i.e.* higher pressure, in winter and relatively warmer air, *i.e.* lower pressure, in summer. Thus, there will be a general movement of air seaward in winter and landward in summer, and this seasonal change has a corresponding daily change—'Land and Sea' breezes are miniature Monsoons.

### Population.

#### 1. Men live in groups by nature and by necessity.

1. Necessity has been the more influential cause. The desire for company is easily satisfied, but trade and defence need numbers, and trade depends on the unequal distribution of commodities in different parts of the world, and the possibility of, and facilities for, transporting them safely from one place to another.

#### 2. The character of the group depends on the character of the country

1. For instance, amongst hunting tribes every man is his neighbour's enemy; from the nature of his occupation he prefers to follow it alone, and therefore his progress in civilization is very slow. In a land where there was no domestic animal which gave milk, and no grass out of which bread could be made, the Australian Black became a houseless cannibal; the Eskimo, living in a cold desert, not a hot one, has to build a house of ice, and to make weapons out of the bones, clothes out of the skins, fuel out of the fat, and food out of the flesh, of animals slaughtered in the chase.
2. The Bedouin and the Lapp represent a great advance. Both have a domestic animal which provides food, cloth

ing, and transport—the camel and the reindeer; both have besides a staple food—dates and fish, both are nomads, though the one wanders mainly in other people's business and the other for his own food; both are traders, though the one collects furs on the outskirts of the world, while the other trades through the heart of it to rich lands on either side, both depend very slightly on outside supplies, and despise the slavish tiller of the soil

3. Like the Lapp, a fisherman is a hunter, engaged in destroying the resources of nature instead of increasing them; but, like the Arab, he is also a trader. His boat is his camel ('ship of the desert'); and, as he leaves his womenkind to look after the homestead while he is away on his trading or his raids, much power passes into the hands of women. Then, too, a perishable raw material, *e.g.* fish, will give birth to a local industry, *e.g.* fish-curing
4. Hunters, shepherds, fishermen, migrate easily and willingly; as agriculture and industries are introduced, population becomes denser and more stationary. Hunters know neither union nor obedience; shepherds combine to tend and protect their flocks; the habit of prompt obedience at sea makes authority respected amongst fishermen, while the division of authority between father and mother prevents it from becoming 'unlimited'
5. Man thrives best in the temperate latitudes, where labour is necessary, but generally rewarded by results; and where the heat and the natural supply of food are not sufficient to make him lazy and unambitious.
6. Almost all the great industries may be classed under two heads—agricultural and manufacturing. The former are mainly connected with large areas of fertile soil, which are generally found on plains between the latitudes of 30° and 50° N and 20° and 40° S. The latter are mainly connected with rich deposits of coal and iron or constant supplies of water-power, and they are, therefore, generally in the neighbourhood of hills or mountains on which there is a considerable rainfall.
7. Even if a country has all possible physical advantages—easy access to raw materials, abundance of fuel and water-power, unique facilities for collecting and distributing its products, and a climate well suited to the production of necessities—political circumstances must still be considered. For successful commerce there must also be personal freedom and security of property, absence of injurious government interference (*e.g.* monopolies), helpful

interference in such matters as the spread of education, provision of harbours and lighthouses, collection and distribution of information valuable to producers, etc

3. With the introduction of industries, city life begins; and the site of a city depends on considerations of defence, access, and natural wealth

1. Easy defence implies the impediment of hills, the isolation of water, or the protection of superstition. Thus, the old centres of Edinburgh, Stirling, Dumbarton, stand on precipitous rocks; Tyre, Venice, Cadiz, were protected by water; Catania, Bethel, Llandudno, were sacred.
2. Easy access implies some 'line of least resistance' to communication—a harbour, a plain, a river-valley. The names of Portsmouth, Le Havre, Havana, speak for themselves; roads or railways across a plain must meet at such places as Moscow, Berlin, Winnipeg; Tiflis, Turin, and Peshawar command mountain passes, caravan routes converge on Damascus, Timbuktú, and Bukhara, the river and river-side traffic has created the great waterway and railway junctions of Allahabad, Belgrade, Montreal.
3. Natural wealth varies with the progress of civilization. In olden times flint for making and sharpening weapons attracted population to Salisbury, Winchester, and the route of Icknield Street generally; clay for domestic utensils attracted them to Southampton, London, and Colchester; salt for preserving meat for winter use attracted them to Northwich, Nantwich, and Droitwich. In modern times, coal, iron, and precious metals have done similar work: cf Cardiff and Pittsburg, Graz and Dannemora, Johannesburg and Coolgardie, Kimberley and Diamantina, Silverton and Leadville.

4. Further, the conditions of modern life cause population to gravitate to a few very large centres.

1. In an Oceanic Empire like the British, these centres are almost always the harbours on which all trade converges to enter or leave each country
2. Climatic conditions also affect the distribution of population. A surplus population, finding a climate similar to that of their mother-country—with similar vegetation and conditions of human life—will form Colonies of Settlement, *e.g.* Canada; where the conditions of life are so different as to

be prohibitive of such settlement, there may still be Colonies of Exploitation or Trade, *e.g.* in Tropical Africa.

3. In Colonies of Settlement the harbours are of relatively less importance than in Exploitation Colonies; *e.g.* Halifax (N.S.) is relatively less important than Singapore.
5. The essentials of a really valuable harbour are:
  1. A large, deep, safe anchorage, *e.g.* Walvisch Bay contrasted with Port Elizabeth.
  2. Easy access from the ocean in any weather or at any state of the tide, *e.g.* Sydney (N S W.) contrasted with Durban.
  3. Easy communication inland, *e.g.* Montreal contrasted with Bombay.
  4. Facilities for coaling, *e.g.* Esquimalt contrasted with Melbourne.
  5. Rich land or dense population behind the harbour, to give certainty of return cargo without delay or difficulty, *e.g.* Calcutta contrasted with Trincomali.
  6. Freedom from heavy duties and other 'uneconomic' disabilities, *e.g.* Hong-Kong and Halifax.
  7. Protection of situation or fortifications, *e.g.* Gibraltar or Aden.

### Some Commodities.

1. Wheat is the most important Bread-Stuff. It is simply a grass, which becomes top-heavy when it is ripe, and which therefore requires special conditions of soil and climate.

1. It needs all the support that its roots and stalk can get from a stiff soil, and it can easily be injured by wet winds. Further, as a grass, it requires sunlight and moisture, and its cultivation is impeded by mountains and rocky soil.
2. It will, therefore, grow best on a warm dry plain, which has a soil stiff enough to support the plant and to retain moisture; and rich soil and easy access are additional advantages.
3. Such plains are found in the east and centre of Europe, the prairies of N America, the pampa of S America, and the rolling lands which stretch northward and southward from the huge watershed of Central Asia; and questions of

irrigation or transport draw special attention to the Volga, St Lawrence, Mississippi, Plate, Indus, and Obi

Russia is the largest producer of wheat (c 100,000,000 quarters), but cheapness of land, admirable agricultural machinery, and economic methods of transport, make the United States a close rival (c 90,000,000), though her large wheat-eating population makes her a small exporter

2. The most important substitutes for wheaten bread are Rye, Potatoes, Rice, Maize, Barley, and Millet.

- 1 Rye and potatoes can be grown on poor soils in inclement climates, *e.g.* in Ireland, Finland, and Pomerania. Rye is largely used in distilling—whisky in U S A, gin in Holland, and vodka in Russia, and potatoes are used for similar purposes in Germany, the largest producer. Cf p. 17.
2. Maize and rice require heat and moisture—maize in a moderate degree, as in the temperate latitudes along the Dniester, Danube, and Mississippi; rice in a much greater degree, as in the Tropical and semi-Tropical latitudes along the Irawadi, Me Nam, and Yang-tsi-kiang. The U S A. 'Corn Belt,' which produces three-quarters of the world's crop of maize, stretches from Nebraska and Kansas to Ohio. It is largely 'fed' locally to 'hogs' and cattle, but it is also exported to Europe, and is used widely in distilleries and in starch and glucose factories. Cf p. 232.
3. Millet can flourish in a dry climate and on poor soil, and is therefore the staple crop in a country like the province of Madras. Barley has a large climatic range; it is grown in north and central Europe, especially in Russia, Austria, Britain, and Germany, for brewing beer and distilling whisky. The famous Californian barley is used almost entirely in brewing.

3. The best Meat will come from rolling grass-lands where the air is clear and bracing, the ground firm and dry, and yet the water-supply unfailing.

1. Such conditions are only to be found on a large scale amongst the foot hills on the leeward side of some great mountain range, *e.g.* the leeward side of the Rockies, the Andes, the New Zealand Alps, and the European Alps. This accounts for the huge production of meat in the U S A (Iowa to Texas), Germany (Bavaria and Saxony), the Plate region (Fray Bentos and Paysandu), and the Canterbury Plains of New Zealand.

- 2 Cattle are raised in U S A mainly for food, in India and South Africa mainly for draft-work, in Russia and hitherto in South America mainly for hides, bones, and tallow. They are most numerous in India, U S A, Argentina, and Russia. India is a great source of hides and skins, and Argentina completely dominates the beef market.
- 3 Canada is the largest cheese-exporter, England, Switzerland, Italy, France, and Holland specialize in fine qualities of cheese. Holland specializes also in margarine, and Denmark and Russia specialize in butter.
4. There are three great Fishing centres in the world, and three really important species of fish (for food).
  - 1 The three centres are off the north-west corner of Europe, in the north-west corner of the Atlantic, and in the north-west corner of the Pacific—where there are large submarine banks near enough to the surface of the sea to be covered with seaweed in which the fish can find their food.
  - 2 The three qualifications for a fishing centre are abundance of fish, proximity to the fishermen's homes, and easy access to markets. The three most important species of food-fishes are the cod, the herring, and the salmon—the cod preferring deep salt-water, and the herring shallow salt-water, while the salmon require alternately both.
  - 3 The general idea that fish caught in tropical waters are unwholesome, is erroneous, but the colder the water, the better the fish—for food. Consequently, the river-made banks off the Yang-tsi-kiang produce coarser fish than the Newfoundland Banks, for the latter have been, and are still being, 'faced' by the melting of icebergs brought down by the cold Labrador current into the Gulf Stream, and the consequent precipitation of the soil that all icebergs carry from the land on which they were built up.
  4. Newfoundland, Canada, and Norway export large quantities of salted cod to the Roman Catholic countries of Europe and to 'Latin' America, Norway and Britain export salted herrings to Europe, Alaska and British Columbia export tinned salmon, halibut, etc.
  5. Sturgeon, and its various products, are exported mainly from the Caspian and Black Seas, more than three-quarters of the world's supply of oysters comes from the Chesapeake and Long Island beds, though the smaller products of Britain, Holland, and France are of very fine quality, Canada and Newfoundland supply the chief lobster markets.



5. The total Coal-production of the world is about 1,200,000,000 tons a year, of which U S A. produce  $\frac{2}{5}$ , and the United Kingdom produces nearly  $\frac{1}{4}$ .

1 Germany comes third with about 160,000,000 (excluding lignite), and in 1912 Austria-Hungary raised over 51,000,000, France *c* 41,000,000, Russia *c* 31,000,000, and Belgium *c* 23,000,000

2. We have completely lost our old control of the coal market, on which our whole commercial position really depends. Even before the war our miners had reduced their output in 40 years from 312 tons *per cap* to 244, with a consequent rise in price from 4s (at the pit) to 9s, while the U S A. miners had raised their output in the same time from 400 to 660 tons, with a lowering of price from 6s 6d to 6s 1d.

*N B*—Now (July, 1919), our export trade has been practically stopped, and France and other neighbouring countries are importing U S A. coal. In 1913, 49 p c of all our exports to Italy, *c* 40 p c to Sweden, *c* 38 p c to Denmark, *c* 29 p c to France were coal!

6. As Iron has rarely any value unless found near coal, the same three countries have also been the great producers of iron.

1. The existence of coal, iron, and limestone near to one another forms the basis of all manufactures and of transport both by land and sea, and marks out the natural areas of industry.

2. Our 'island' conditions led naturally to specialization in shipbuilding, the huge 'continental' distances of the U S A. led to the development of railway plant, Germany paid most attention to various chemical industries.

*N B*—Even before the war, however, we held only 4th place in the output of iron, with  $\frac{1}{10}$  of the whole world's supply (150,000,000 tons of ore), and France will now easily take second place to U S A. ( $\frac{1}{3}$  of total).

7. The great Mineral-oil deposits of the world are in U S A., Russia, and Mexico.

1. The U S A. oil now comes mainly from Texas and California, which are also rich in natural gas, the Russian product comes from the Caucasus district.

2. In both cases the crude petroleum is pumped through pipes, for hundreds of miles, from the wells to the refineries or the ports, *e.g.* from Baku to Batum.

8. For Clothing purposes, the most important vegetable products are Cotton and Flax, and the most important animal products are Wool and Silk.

1. Cotton grows best on light soils in warm, moist, even climates, with salt in the soil or in the air—that is, on low land near the sea in Tropical and semi-Tropical latitudes, *eg* in the south-east of the United States, the Delta of Egypt, and the river valleys of the Deccan. It can only be spun successfully in damp climates, in which the yarn can be subjected to great tension without fear of snapping; artificially damped mills, *eg* in Austria and Germany, cannot compete with mills in an insular climate, *eg* England and Japan

The United States produce considerably more than  $\frac{2}{3}$  of the total cotton crop, their long-staple 'sea-island' fibre—grown mainly between Charleston and Savannah—being the finest in the world. The Egyptian fibre is also fine and long, that of Brazil is rather coarse and long, the Peruvian is tough, and the Indian is short. Liverpool, Manchester, and Bremen are the largest cotton-markets.

2. The chief wool-exporting regions of the world are Australasia, the Plate basin, and South Africa, because sheep and goats—for wool-making purposes—require a dry temperate climate tending rather to warmth than to cold. Cattle could not live, still less flourish, on the semi-desert 'salt-bush' of New South Wales and the Great Karroo

Turkey-in-Asia and the Cape practically supply all the mohair markets, Australasia and the Cape supply wool to the London market, and Argentina supplies it to the French and German markets, the Argentine product not being popular in England because of the cost of cleaning it. Germany has a very fine home product from Saxony and Silesia, and home products are largely used for the carpets of Philadelphia and the cloth of Boston.

3. The flax fibre grows best on soil that has been fertilized for ages by the decayed leaf-fibre of deciduous forests, *eg*. Central Russia, the silkworm is found wherever the mulberry flourishes, as in the Chinese provinces of Chekiang and Kwang-si, or under the shelter of the Bergamo Alps

Russia produces  $\frac{4}{5}$  of the flax of the world, but the Belgian fibre is the best. China is the largest exporter of raw silk, but Italy and Japan are also very important, mainly because of their cheap labour. The great silk-markets of the world are Lyons, Paterson, N J, and Krefeld.

9. Both Tea and Coffee are of two main varieties—highland and lowland.

1. Apart from the elevation, both varieties of each plant require great heat, heavy rainfall, vegetable refuse, and shelter. The heat and the rain can be obtained near the sea in the Tropics, and shelter and vegetable refuse are afforded by mountains and forests of the coffee plantations of the forest-clad Serra do Mar, and the tea-gardens of the forest-clad Ta-yu-Shan

*N.B.*—‘Liberian’ coffee and ‘Assam’ tea are lowland varieties.

2. Brazil produces three-fourths of the world’s crop of coffee; smaller quantities of finer qualities are grown in the Deccan, Central America, the East and West Indies, and Arabia.
3. India, Ceylon, China, and Japan produce almost all the tea in the world. India and Ceylon produce by far the largest amount; Japan specializes in ‘green’ tea (mainly for U.S.A. markets)

10. Cacao and Cane-sugar are both lowland plants, and both require great heat and moisture along with volcanic alluvium.

1. Sugar also requires salt and lime, and therefore grows best along a sea-coast, *e.g.* the East and West Indies (especially Cuba and Java) and the Hawaiian islands, while cacao grows inland, *e.g.* in the Orinoco and Magdalena basins, especially in Ecuador. The Gold Coast is the largest producer
2. Recently the sugar-beet of poor land in the Temperate Zones, especially in North and Central Europe, has become more important than the cane-sugar of rich Tropical coastlands—partly because of ‘bounties’ and the abolition of slave-labour, and partly because the Teutonic nations are the great consumers of sugar. Germany is much the largest producer of this beet-sugar for export. Cf p 69

11. Sugar is one of the products used in the manufacture of various Alcoholic drinks—wine, beer, and spirits.

1. Wine is the most important of these drinks, and ought to be simply the fermented juice of grapes, and, as the vine flourishes best on dry sunny slopes (of from 30° to 45°) in latitudes where the autumns are long, we may at once infer that the best grapes will be grown on south-western slopes between 40° and 50° N., and on north-eastern slopes between 30° and 40° S.

France produces more than one-third of the wine in the world, including 'Burgundy' from the Côte d'Or hills, 'Champagne' from the Marne lowlands, 'Claret' from the Gironde lowlands. Italy produces nearly a quarter of the total amount, including 'Chianti' from the Tuscan hills, the 'Capri' of Naples, and 'Marsala' from the west of Sicily. The Spanish peninsula produces nearly one-fifth, including 'Port' from the torrid basins of the Douro and the Ebro and 'Sherry' from the coastlands of Andalusia.

The Californian valleys and the stony downs of eastern Australia are beginning to be serious rivals of the older producers; and the intensely dry heat in both areas greatly encourages the curing of raisins. At present, however, the scalded Valentin raisins of Spain, the purely sun-dried Muscatels of Egypt, the Sultanias of Asia Minor, and the Currants of Greece command the market.

*N B*—At present wine making in U S A. is stopped.

- 2 Beer ought to be made simply of malt and hops, but other cereals besides barley are used. Germany is the largest producer, followed by Great Britain and the United States.

*N B*—Brewing in U S A. is also at a standstill.

- 3 Spirits are distilled from various fermented liquors, and owe their special flavour to the character of the liquor. 'Brandy' is distilled properly from wine, especially in the Charente district of France; 'whisky' ought to be distilled from barley, but other cereals, *e.g.* rye and maize, are used, 'rum' is a sugar product, and real 'gin' is flavoured with juniper, the taste of which—though not the medicinal effect—can be imitated by decoctions of turpentine.

*N B*—Peculiarly injurious kinds of spirits, generally called 'whisky,' are made on the continent of Europe from various roots, *e.g.* potatoes and beet, especially in Germany.

12. Tobacco grows in both the Temperate and the Torrid zones, but succeeds best on a limestone soil well supplied with fibrous matter.

1. Purely 'Marine' products, *e.g.* from Cuba, Manila, and Sumatra, are specially suited to the manufacture of cigars.
2. Purely 'Continental' products, such as those of the upper Garonne, upper Danube, and Ohio valleys, are best adapted for pipe-smoking; and they make the best snuff.
- 3 'Semi-marine' products, such as those of the Syrian and Anatolian coastlands, the Delta of Egypt, and Virginia, are most used in cigarettes.

13. The great Swine-producing countries are those which include areas of maize,<sup>1</sup> but their products are by no means the best.

1. The United States 'Corn Belt' raises about one-third of the total number in the world, the Danube basin coming second. And these two areas are, therefore, the great exporters of such by-products as bristles, lard, sausage-skins, etc
2. Very large numbers are raised, under healthier conditions, in Canada, Denmark, and North Germany, Westphalian hams being specially famous.
3. For delicacy of flavour the much smaller product of the United Kingdom holds the market,—Wiltshire and Westmoreland bacon, and Cumberland and Yorkshire hams being the best in the world.

14. The great Forest products of the world come from the parts of the Temperate zones where there is most snow, and from the parts of the Tropics where there is the heaviest rain.

1. The ordinary timber of commerce comes from between the Arctic Circle and 30° N.,—Canada, Russia, and Scandinavia being the great producers. It is of two main kinds—'soft,' 'building' timber, obtained from cone-bearing trees, which also supply turpentine and other by-products, and 'hard' 'furniture' timber obtained from deciduous trees.

Of the conifers, the most important is 'red pine,' or Scotch fir, which comes mainly from Russia and Scandinavia; 'yellow pine,' or Weymouth, comes mainly from Canada; 'white deals,' generally Spruce, come from Norway and Poland. The bark of the hemlock-spruce is used in tanning.

2. The tropical and semi-tropical products are mainly used for 'cabinet' purposes, especially the mahogany of Central America. Teak, bamboo, and eucalyptus are exceedingly valuable in different ways; and there is an enormous demand for the rubber of various creepers found specially in the Amazon and Congo forests, and the gutta-percha of the East Indies. The largest supplies of cultivated rubber come from the Malay peninsula and Ceylon.

<sup>1</sup>The great rise in the price of U S A. 'hogs' in recent years is largely due to the rise in the price of maize

### Trade Routes.

1. As nearly three-quarters of the earth's surface is water, and as transport by water is much cheaper than transport by land, most commerce is conducted by water.

1. Cheapening of sea-carriage has been effected by scientific use of the regular currents of wind and water, by the provision of larger ships and better machinery, and by the substitution of steam or electricity for wind as the motive power
2. Shortening of distance, which involves shortening of time and so indirect economy, has been effected by the making of ship-canal, such as the Suez, the Corinthian, the Kaiser Wilhelm, and the North Holland Cf the Panama Canal
- 3 Avoidance of transshipment of goods—another great economy (cf the importance of a uniform railway-gauge)—has been effected by the deepening of harbours, *e.g.* at Glasgow, Rouen, Montreal, to admit larger vessels or give access farther inland, and by the construction of quite artificial waterways, such as the Manchester Ship Canal.

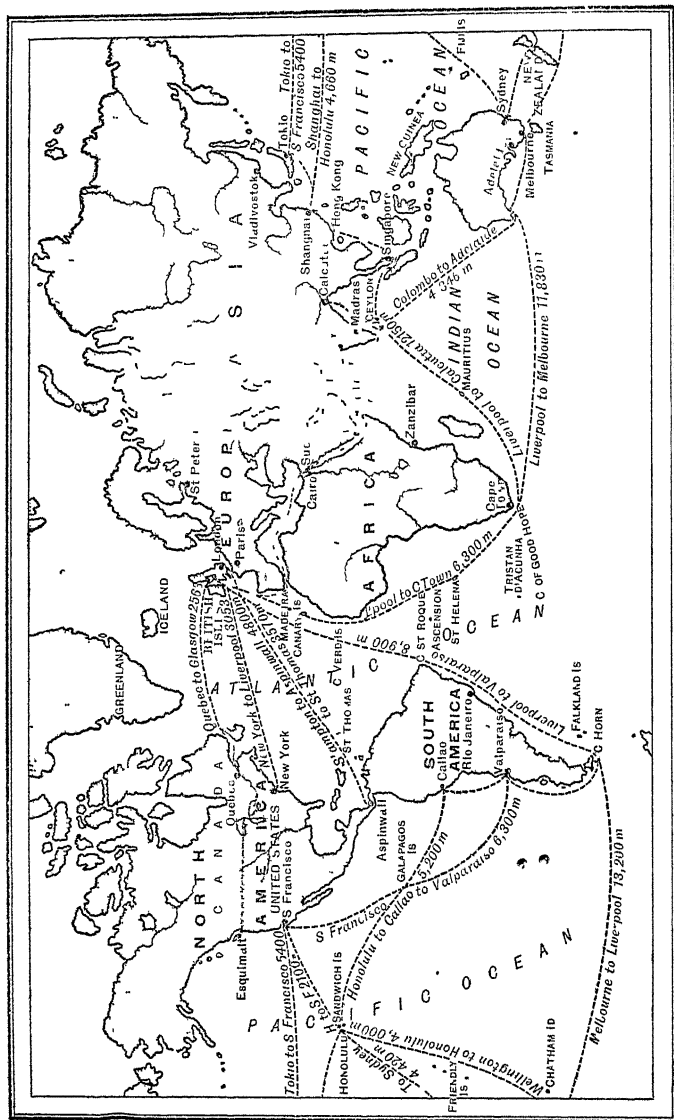
2. There are five great highways of British commerce—the Atlantic, the Suez, the Cape, the Plate, and the West Indian.

1. There are also subsidiary routes branching off these to the trade centres of other countries.

3. The Atlantic route, with abundance of steam coal on both sides and a comparatively short journey, does not need coaling-stations *en route*

1. The more northerly trade includes, besides the Canadian products, grain and timber from the Eastern States of the Union, and fibre and fruit from the South-Eastern
- 2 The chief ports are Boston, New York, Philadelphia, and Baltimore; Wilmington, Charleston, Galveston, and New Orleans—besides the Canadian ports.

4. The Suez route commands the East African, Persian, and Arabian, Indian, East Indian, and Australian trade.



THE CHIEF OCEAN ROUTES OF THE WORLD.

1. Besides the special Indian, East African, and Australian products, the trade includes Arabian gum, Persian carpets and opium, East Indian sugar and spices, Manila hemp and tobacco, Chinese tea and silk, etc ; and the chief non-British ports are Jedda, Bushire, and Basra , Bangkok, Canton, and Shanghai ; Nagasaki and Yokohama.
2. This route includes the Mediterranean area, which is very important , it is guarded by Gibraltar, Malta, Aden, Perim, Diego Garcia, Singapore, and Hong-Kong.

5. The products of this Mediterranean region include :

1. Various fruits, *e.g.* oranges and nuts, from Malaga, Almeria, Valencia, and Barcelona.
2. Wine from Cete, and olive-oil, soap, scent, silk, and edible pastes (*e.g.* macaroni) from Marseilles.
3. Wine, oil, fruit, sulphur, and marble from Palermo, Messina, Naples, and Genoa
4. Wheat from Trieste and Fiume, currants from Patras and Piræus, and carpets and tobacco from Salonica and Constantinople.
5. Maize from Sulina, Galatz, and Braila, wheat from Odessa and Kherson, petroleum from Batum, and silk from Trebizond
6. Raisins, figs, oranges, beans, etc , from Smyrna, Beirut, and Jaffa.
7. Cotton, wheat, and onions from Alexandria, gum and ivory from Tripoli, barley and esparto grass from Algiers

6. The Cape route is now specially the South African route. It is badly supplied with coal.

- 1 It still commands part of the Australian trade, and is guarded by Ascension and St Helena , but it cannot compete—in time of peace—with the Suez route, or—in time of war—with the Canadian Pacific Railway route.
- 2 Besides the special South African or West African products it includes the rubber, palm oil, and ivory of the Congo

*NB*—The connection of the 'Severn' ports with West Africa was partly due to the use of palm oil in the tin-plate industry

7. The Plate route is the old 'Cape Horn route' to Australia Imported coal is cheap because of the heavy cargoes outwards.



- 1 It includes the Brazil trade in rubber, coffee, rosewood, diamonds, etc, from Para, Bahia, Santos, and Rio de Janeiro, and the typically 'Plate' trade in grain, wool, and meat, from Montevideo and Buenos Aires
8. The West Indian route has been greatly affected by the Panama canal.
  1. Besides the special West Indian products, the trade includes Mexican mahogany, tobacco, and silver from Vera Cruz.
  2. The rejected Nicaragua route is longer than the Panama route, but it is lower, healthier, and freer from earthquakes and floods—very important points for a canal.
  3. Either route will save about 6000 miles between London and San Francisco, and 9000 miles between New York and San Francisco, and this will affect the North American Pacific Trade, *e.g.* from Vancouver and Victoria.
- 9 By far the most important medium of land transport is the railway.
  1. The most important lines in the world are the *Canadian Pacific (C.P.R.)* and the *Trans-Siberian (T.S.R.)*, both of which illustrate specially the value of railways in 'continental' countries, but even in 'maritime' countries railways have become absolutely indispensable.
  2. In Europe special attention should be paid to the lines which run (a) from Calais to Marseilles; (b) from Rotterdam and Hamburg to Genoa and Brindisi; (c) from Stettin to Trieste; (d) from Paris to Salonica and Constantinople; (e) from Paris to Moscow; (f) from Hamburg to Odessa; (g) from Lisbon and Cadiz to St. Petersburg
  - 3 In America special attention should be paid to the lines which run (a) from Halifax and Quebec through Montreal to Vancouver and Prince Rupert; (b) from Duluth to Seattle; (c) from Boston, New York, and Philadelphia, through Chicago to San Francisco; (d) from Philadelphia and Baltimore through St. Louis to San Francisco; (e) along the east coast from Boston to Pensacola; (f) near the west coast from Tacoma to San Diego; (g) down the centre from Winnipeg to New Orleans.

## EUROPE—PART I.

### British Isles.

1. The general position of the British Isles gives them certain great commercial advantages.
1. The latitude implies a temperate climate, except where height interferes, and guarantees at least 17 hours of sunlight per day during the months best suited for growing crops.
2. The exposure to the S W Anti-Tradewinds guarantees abundance of rain, especially in the west, and of transferred heat.
3. The insular position further protects the islands from extremes and from sudden changes of climate, it is peculiarly favourable to textile and pastoral industries, and necessitates all commerce being carried on by sea—the cheapest of all methods of transport.
4. The shallowness of the surrounding seas protects the land from the influence of the deep Arctic currents, which are intensely cold; it is the main cause of the great fishing industries (especially on the Dogger Bank), which are the backbone of our mercantile marine, and, along with the shape of the chief estuaries, it is the cause of the high tides, which are such an aid to shipping, and which will be of enormous industrial importance when tidal power begins to be applied to mechanical purposes
5. Owing to the excessively long and broken coast, no place in the whole country is ~~100~~ 50 miles, and no manufacturing centre is even 50 miles, from the sea, and there are numerous harbours, the best of them being back-to-back—the Clyde and the Forth, the Mersey and the Humber, the Severn and the Thames

6. The nearness to Europe gives easy access to many of the most important markets in the world, without involving 'continental' drawbacks, *e.g.* frozen harbours in winter.
  7. The latitude and longitude together make the islands practically the centre of all the land in the world, and therefore guarantees a constant transit and forwarding trade apart from any home industries; for instance, more than half the U S A freight, and nearly half the Russian, Belgian, Dutch, and French freight is carried by Britain.
2. The character of the surface has greatly emphasised these advantages of position.
1. The presence of mountains along the whole of the west coast not only guarantees a constant and sufficient rainfall, but also causes the longest rivers to be moderately slow and to empty eastwards—towards the Continental markets.
  2. The heavy rainfall in the mountainous districts laid bare the minerals on which our manufactures depend; it makes these districts peculiarly suitable for textile industries, and it favours the growth of the cattle-pastures on which the dense population of the textile centres depends for milk.
  3. The constant rain and the numerous rivers have covered the lower areas, which are the most suitable for cultivation, with a good depth of soil; and the barrier of the western mountains gives these areas a climate sufficiently dry to be favourable to agriculture.
  4. The narrowness of the country guarantees these drier regions from drought, and makes even inland towns like Leeds and Bradford suitable for textile industries.
  5. As the islands are so small, they cannot supply enough food for their dense population; but, for the same reason, they have a uniformity of temperate climate which involves throughout the whole land the least possible interference with daily labour at all seasons of the year.
3. In spite of the small area, the general 'relief' of the land allows much use to be made of the rivers.
1. For instance, the largest vessels can navigate the Thames estuary for 50 miles—up to London, and the high tides enable even an insignificant stream like the Lower Avon to be navigated up to Bristol.
  2. Sea-going vessels can reach Goole and Gainsborough on the upper branches of the Humber basin; and the ship-canal

from Sharpness to Berkeley allows similar vessels to reach Gloucester (cf the more important Manchester ship canal)

- 3 Barges can reach Burton on the Trent, Welshpool on the Severn, and Lechlade on the Thames, the valleys of the Aire and the Calder give canal communication between Lancashire and Yorkshire, the Upper Trent canals form part of the 'Grand Trunk' system between the Mersey and the Thames, and a canal from Lechlade joins the Thames to tidal water on the Severn. But even the Aire canal is often short of water.
- 4 The marshy saucer-like plain, which is the great feature of the interior of Ireland, enables the Shannon to be navigated for 200 out of 225 miles—up to Lough Allen
- 5 The importance of the Scotch river system is mainly due to the relation of plain to mountain, for communication across the chief mountain chains is almost entirely dependent on the river valleys, *e.g.* those of the Spey and the Tay (*Highland Railway*), the Nith and the Ayr (*Glasgow and South-Western*), the Annan and the Clyde (*Caledonian*).
- 4 The vegetation may be roughly classified as grass, plough-lands, or trees (forest and fruit) .
  1. The land produces more, per acre, of every staple food suited to the soil and climate than any other land in the world, but, as the population is also denser—for the cultivatable area—than in any other land, necessities of life (food) and of industry (raw materials) must be imported.
  5. Two-thirds of the whole usable area of the country is under grass, permanently or otherwise.
    1. More than a quarter of the area in Great Britain is under clover and other sown grasses; but in Ireland it is nearly all permanent pasture, and Ireland has altogether about half as much grass-land as Great Britain.
    2. On this area Great Britain feeds about 1,500,000 horses, 7,000,000 cattle, and 27,000,000 sheep; while Ireland feeds 500,000 horses, 4,500,000 cattle, and 4,000,000 sheep. The presence of large towns in England makes farmers devote special attention to milk, while their absence in Ireland makes butter the special product. But for our huge city population the milk supply is miserably deficient; more than a quarter of our supply is used for making butter and cheese, and hundreds of gallons go bad every day, because the poor cannot afford the price demanded for it.

- 3 Both pastoral and agricultural industries are suffering severely from increase of rates and taxes, wages and insurance, etc

6. After the repeal of the Corn Laws the grain-area decreased steadily down to 1905, mainly owing to foreign competition, high rents, and the expense of transport and manure, but it has *increased* greatly during the war.

- 1 Wheat is now practically confined to the dry eastern plain, especially the clay lands of the Thames and Wash basins (cf Reading), and supplied 35 p c of our bread in 1918.

The most reliable supplies of imported wheat come from Argentina, India, and Canada; the Russian crop is uncertain, and the 'home' demand in U S A is growing very fast

2. Barley is mainly confined to the mixed clay-and-chalk lands of the English Midlands and to the river valleys of eastern Scotland, especially along the Trent and the Tay (cf Bilton beer and Strathmore whisky)

Of imported barley,  $\frac{1}{3}$  comes from Russia, and  $\frac{1}{4}$  (in about equal proportions) from U S A. and Turkish-Asia.

3. Oats can flourish in a much damper climate, and are, therefore, grown widely over Ireland and Scotland.

*N B*—Lincolnshire is the most important county for all three grains.

7. The area under 'green crops' has also been decreasing, but not to nearly the same extent.

1. Potatoes are still the most valuable of all the Irish crops, and are also largely grown in Yorkshire, Lincolnshire, and the Scotch lowlands. Turnips are essentially a Scotch crop, Banffshire producing the finest in the country; but Norfolk and Suffolk also produce considerable quantities.

*N B*—In 1918 we grew over 99 per cent of the potatoes we used

- 2 Peas, beans, and hops are essentially English crops—the two former in Lincolnshire and Suffolk, while the hops are largely confined to Kent and Surrey, Worcestershire and Herefordshire Essex grows all three

3. Garden vegetables are grown in large quantities round all the big towns, especially London, and the Scilly Isles grow early vegetables for the London market

8 The area under forest has also decreased enormously, but not recently; the fruit is mainly apples, pears, plums, and cherries.

1. The 6 per cent of the country that was still under forest (400 square miles in the New Forest and the 150 in the Dean Forest) has been dreadfully devastated since 1914
2. The most famous of the old forests, *e.g.* Sherwood, Epping, and the Weald, were largely used up for smelting iron in former days, and there is pressing need for reafforesting—to the extent of at least 2,000,000 acres
3. The chief commercial woods are oak and beech, which are found mainly on the lower and more fertile parts of England and Ireland, elm and ash are also important, and in the far north the soil and the climate favour the birch and the Scotch fir
4. The apples and pears come chiefly from the Severn Valley, of Devonshire and Herefordshire cider and Worcestershire perry; while the cherries and plums come chiefly from Kent and the other 'Home Counties' (cf. London jams).

9. As the British Isles are composed of a great variety of rock, they contain a great variety of mineral wealth; but the supply of coal and iron is so abundant that the other minerals have been comparatively ignored.

1. About  $\frac{11}{12}$  of the 'metal' wealth of the country is in iron, and about  $\frac{8}{9}$  of the 'non-metal' wealth is in coal, the total production of coal being eight times as valuable as that of iron.
2. Except in Ireland, these two minerals—the most important of all minerals—have three great advantages: they are found side by side, close to navigable water, and along with abundant supplies of limestone and gannister—the limestone for a 'flux' in smelting and for a 'base' in converting steel, and the gannister for an insoluble 'lining' to the converters
3. In the production of coal the United States is our only serious rival; but its rivalry is most serious, because its seams are thicker, more concentrated, more recently opened, and much more easy to work than ours, and, consequently, the coal is much cheaper. Cf p 14.

10 Of the 287,400,000 tons produced in this country during 1913, about two-thirds were produced by England, and one-sixth each by Scotland and Wales.

- 1 The average production of the chief counties varies between 12 and 42 million tons, typical returns being
 

Durham,	41.7	Lancashire,	23.7	Northumberland,	14.7
Yorkshire	39	Lanarkshire,	17.5	Staffordshire,	14
Glamorgan,	31	Derbyshire,	17	Monmouth,	13.8
- 2 The Irish coal-fields are small, separate from the iron-fields, and far from the sea, and, owing to political troubles and want of capital, they have not been properly worked
- 3 Coal to the value of £40,000,000 has been exported to and far from the sea; and, owing to political troubles and want of capital, they have not been properly worked
- 3 Coal to the average value of £40,000,000 is exported to foreign countries annually. The most important 'home' demands are—for transport (steamer and railway), well over 20,000,000 tons, for blast furnaces, nearly as much, and for gas, somewhat less than for the furnaces.

11. As the iron is found on the various coal-fields, it is put to various uses. Cf. note on p. 40

1. The 'coast' fields specialise in shipbuilding (Cf. the Newcastle coal and Cleveland iron, the Whitehaven coal and Furness iron, the Glasgow coal and Lanarkshire iron.) The British yards in 1914 supplied  $\frac{1}{11}$  of the world's output.
2. The 'inland' fields to which import of raw materials is easy, specialise in textile machinery—'cotton' machinery on the Lancashire coal- and iron-field, and 'woollen' machinery on the Yorkshire. Cf. p. 23.
3. The 'inland' fields to which import of raw materials is not so easy, specialise in hardware; and their characteristic products are articles which demand a considerable amount of labour for a small amount of raw material. Cf. the screws, pens, pins, nails, needles, watch-springs, and bicycles of Birmingham. • •

12 Next to coal and iron, stone and slate are much the most valuable, the annual output being nearly two-thirds the value of the pig-iron (from Home ore).

1. The most important stone products are marble and granite—the marble mainly from Derby, Kilkenny, and Devon, and the granite from Leicester, Carnarvon, and Aberdeen. Of the ordinary building stone—the Kirkcudbright and the oolitic limestones of Portland and Bath are the best.
2. Silica is found everywhere, but is not much used except where the addition of coal and salt have encouraged glass industries, e.g. at Newcastle, St. Helens, and Birmingham.

3. The only good slates come from North Wales, but inferior qualities are worked in Cumberland, Perth, and Argyll.

13. The other minerals include clay, salt, tin, oil-shale, lead, and zinc

1. Buck-clay is fortunately quite common, but the deposits in the Thames basin have been specially valuable in the extension of London, fire-clay comes mainly from Stour-bridge; and china-clay was originally worked in 'the Potteries' district of the Trent basin, but is now taken there from the decayed granite of the Tamar basin

Tin also comes from Devon and Cornwall

2. The two great salt-fields are the 'Cheshire' and the 'Cleveland,' the valleys of the Weaver and the Wheelock being specially rich in the mineral; and the combination of salt and coal has given rise to great chemical industries, *e.g.* at Newcastle and St Helens.

3. The shale is confined almost entirely to Fife and Linlithgow, where it supports the 'paraffin' industries of Bathgate.

4. The lead comes from several districts, including Flintshire, Derbyshire, the Isle of Man, Lowther Hills, Durham, and Westmoreland

5. The zinc comes mainly from Cumberland, the Isle of Man, Flintshire, Denbigh, and Cardigan.

14. Sheep are found all over the country, but specially on the moors and downs of England and on the highland districts of Wales and Scotland

1. The drier moors and downs produce the better wool, while the damper mountains produce the better mutton

2. Thus, the three great woollen districts of Yorkshire, Gloucestershire, and Roxburghshire are overlooked by the downs which have given their names to the special 'Lincoln,' 'Cotswold,' and 'Cheviot' breeds of sheep

3. The 'Blackfaced' mutton of Wales and Scotland is the best in the world, and is reared largely on a barren granite soil, while the best wool is raised on chalk and limestone.

Of imports,  $\frac{5}{11}$  of the mutton comes usually from New Zealand, and  $\frac{1}{3}$  from Argentina,  $\frac{2}{3}$  of the wool from Australia

15. Cattle are most numerous in the lower and milder parts of the country, and their kind and use vary with the soil and climate.



1. The sandstone of Cheshire and Devonshire, and the mild climate of Jersey and Guernsey, produce the best cream and butter
2. The lias of Somersetshire, Gloucestershire, and Leicestershire produces the best cheese, especially round Cheddar and Melton Mowbray, cf Stilton
3. Aberdeenshire and Durham produce the best beef.

*N.B.*—Before the war we were importing annually beef valued at £16,000,000 (mainly from Argentina), cheese valued at £7,500,000 (mainly Canadian), and butter valued at £25,000,000 (mainly Danish). In 1918 we produced at home 58 per cent of our beef and mutton, 57 per cent of our butter, and over 25 per cent of our cheese, but only 10 per cent of our bacon and ham.

16. Horses are mainly used in this country for draught purposes, but a considerable number are bred for sport.

1. The finest cart horses in the world are bred on the carboniferous limestone of Clydesdale and Yorkshire, where their services are most needed (Cf. the horses of the Kentucky limestone, U.S.A.) The best hunters are bred in Ireland, especially in the southern half

17. Pigs are most common in Ireland, but are decreasing in numbers everywhere.

1. The best bacon is 'Wiltshire' (cf 'Berkshire'), and the best hams are 'Cumberland' (cf 'Westmoreland'), and 'Yorkshire.' Bacon and hams were imported to the value of £16,000,000 a year before the war, mainly from U.S.A. and Denmark

18. The fisheries are the most important in Europe, and Billingsgate is the largest fishmarket in the world.

1. The 'deep-sea' fisheries include the cod and flat fish of the Dogger Bank, the herring and haddock (cf. 'Loch Fyne' and 'Findon') of the Scotch waters, and the mackerel of the English Channel. (Cf. the rise of Milford.)
2. The 'shore' fisheries include the oysters of Whitstable and Colchester, the shrimps of the Wash, and the mussels of the Forth.
3. The 'river' fisheries are comparatively unimportant, except for the salmon of the Scotch and Irish rivers and of the Eden, the Severn, and the Tees.
4. Three-quarters of the total catch (averaging £12,000,000 a year) comes into Great Britain from the North Sea, mainly through the Scotch ports of Aberdeen, Fraserburgh, Wick, and Peterhead, and the English ports of London, Grimsby, Hull, Lowestoft, and Yarmouth.

5. The east coast is well situated, too, for procuring ice (from Norway), salt, and barrels, the salt and barrels being especially necessary in connection with the Scotch herring fishery.

19 The industries of the country may be ranged under five chief heads—commerce, manufactures, mining, farming, and fishing

1. The British Empire covers one-fifth of the land of the globe, and the tonnage of its merchant navy is greater than that of all the other countries in the world put together. Out of over 49,000,000 of tonnage in the world's mercantile marine, nearly half was British in 1914, largely occupied in carrying for foreign nations, and more than  $\frac{1}{2}$  was steam tonnage, of which 3,267,000 tons have been lost

The huge area and varied character of the different parts of the Empire give the command of all kinds of commodities, and the large navy provides every facility for cheap and rapid transport, 90 per cent of our steam tonnage in 1914 being 'large' vessels (over 1600 tons gross)

2. The manufactures of a small country like the United Kingdom must depend largely on the import of raw materials from abroad, and the internal trade of such a country, if rich in coal and iron, must merge in an external trade—conducted, if possible, by water
3. Home manufactures are generally based on (a) a suitable product and climate, or (b) fuel and machinery.
4. The general conditions of manufacturing and mining areas lead to great congestion of population, which reacts adversely on rural industries, and any country which cannot provide itself with sufficient food, must import bread and meat 'stuffs' as well as the raw materials for industry.
5. The fishing industry is a great source of food, as well as other products, and it is the only satisfactory school for a navy, whether royal or mercantile.

20. The commerce of the British Isles centres largely round the great estuaries, especially those of the Thames, Severn, Humber, Mersey, and Clyde.

1. The Thames navigation is not good, and there are no local supplies of coal and iron; but the position opposite the

Rhine and commanding the Dover Straits, and the possession of a double tide which goes 80 miles up the river, give London, including Chatham, Queensborough, etc., unique facilities for commerce. Richborough is a great ferry port.

2. The Severn has the highest tides in Europe, and empties through the richest coalfield in Europe; it has also easy communication inland, *e.g.* by the Upper Avon valley to the Trent valley and the great Central Plain.
3. The Humber is the only useful harbour for miles along the East coast; it leads directly across a rich plain to the minerals of the Pennine slopes; it is well sheltered from the N.E. gales; it is exactly opposite the mouth of the Elbe and the Kiel Canal entrance to the Baltic; it has exceptional advantages for the Dogger Bank fisheries, and it does not depend on any single trade—collecting the agricultural products of the Ouse and the Trent plains as well as the manufactured products of the Yorkshire, Derbyshire, and Staffordshire coalfields.
4. The Mersey flows across a fertile plain, edged with a rich bed of coal in the north and valuable salt-beds in the south; the climate of its watershed, and the character of the water, are most favourable to textile industries; the position tends naturally to trade with Ireland and America; and the local minerals are the base of glass, chemical, and copper industries.
5. The Clyde has a similar position, and the additional advantage of combining all the industries of Scotland—the pasture of the Uplands, the agriculture of the Lowland plain, and the mining and manufactures of the Glasgow coal-and-iron field.
6. The Tay and the Forth are commercial highways through the rich agricultural soil of the Lowlands; the Tyne is essentially a 'coal' river, and the Tees is essentially an 'iron' river. Cf. p. 28.
7. Belfast owes its importance to its position on a good estuary in the centre of the Ulster flax and iron fields, its nearness to the Scotch and Cumberland coal, and the suitability of its humid climate for textile industries.
8. Dublin owes its commercial importance to its position in the centre of the Irish coast opposite the dense population of South Lancashire, its easy communication inland by rail and canal, and the suitability of its water for brewing and dyeing.

- 9 Southampton is the nearest good harbour to London, and is splendidly protected from storms and foes by the strongly fortified Isle of Wight. It has a double tide.

21. Most of the manufactures are directly dependent on the climate and the local supplies of coal.

1. Textiles are much the most important, for the climate and the character of the water supply are such that no other country in the world, except Japan and New Zealand, can *naturally* compete with the British Isles
- 2 Flax and wool are the only textile products grown at home ; and even for these the demand is far greater than the home supply. Flax is imported mainly from Russia (coarser) and Belgium (finer), and wool mainly from Australasia and South Africa
3. The other textile staples—cotton, hemp, jute, and silk—are all imported. Most of the cotton, including most of the finest quality, comes from U S A , the rest comes mainly from Egypt, the Deccan, the Levant, and Brazil. The silk comes from China, India, Italy, and France ; the hemp mainly from Russia and Germany, and the jute entirely from Bengal and Assam
4. Metal work of various kinds comes next in importance to the textiles. The largest iron field is in the Cleveland district (Durham coal) ; the finest quality of iron is in the Furness district (Whitehaven coal). Devonshire and Cornwall produce more tin than any other equal area of the world except the Malay Peninsula. Cf p 40
5. Large quantities of fine Swedish and Spanish iron—Malay and Australasian tin—U S A , Chilian, and Australasian copper are imported, lead is brought from Spain, and zinc from Germany and Belgium. All the gold, silver, and mercury have to be imported—the gold mainly from South Africa, U S A., Australasia, the Russian Empire, and Canada, the silver mainly from Mexico, U S A., the Northern Andes, and till quite recently Canada, the mercury entirely from the Sierra Morena, the Californian Coast Range, and the Julian Alps

22. The cotton trade is by far the most important of all the industries in the country, and is said to represent 66 per cent. of the world's output.

1. Its centre is the ring of torrent-scarred hills on the west side of the Pennine Range, which look out across the Wigan

coalfield towards the New World ; and, as the line of least resistance for traffic trends to the Mersey, Manchester is the great collecting and distributing market.

2. Division of labour leads the towns with the most humid climate and the best water supplies to specialise in spinning, *e.g.* Oldham, Bolton, Rochdale, and Stockport, the chief weaving centres are Preston (finer), Blackburn, Accrington, and Burnley (coarser), the Glasgow coalfield is famous for dyeing, printing, and thread—the two former specially at Alexandria, and the latter specially at Paisley, Nottingham and other inland towns where the climate is too dry for spinning, and the cost of transport is greater, specialise in ‘open-work’ articles the cost of which depends almost entirely on the amount of labour spent on them, not on the amount or value of the raw materials, *e.g.* cotton lace and hosiery
- 3 Cotton machinery is largely made in Manchester, Salford, Oldham, Bolton, Rochdale, and Bury. Like the cotton goods, the machinery seeks export mainly *via* Liverpool, but, while the goods go mainly to agricultural peoples in hot climates, the machinery goes to industrial peoples in temperate climates.

23. The iron and steel industry comes next to the cotton in importance.

- 1 On the Clyde coalfield poor grades of local ore are largely supplemented by fine red-hematite from Bilbao ; the Clyde ports, especially Glasgow, Dumbarton, and Clydebank, are the centre of the largest shipbuilding industry in the world, and the surrounding towns, *e.g.* Holytown, Airdrie, Coatbridge, and Motherwell, are famous for locomotives and machinery generally.

Middlesbrough is the chief smelting centre of the country, using the local Cleveland ‘clay’ ore as well as the fine magnetic ore from Sweden. The product is used by the Tyne, Tees, and Wear ports in shipbuilding, by Newcastle also for cannon (*e.g.* the Elswick ordnance) and general iron work, and for railway plant by Darlington (locomotives) and Middlesbrough itself (rails).

*N.B.*—Note how the two last command the railway traffic converging from the north on to the plain of York Cf § 5, below

3. Barrow uses the fine red-hematite of the Furness district, as Belfast uses the less valuable brown-hematite of Antrim, in shipbuilding, their coal supplies coming from Cumberland (not for smelting purposes), Scotland, and Lancashire.

4. South Wales smelts its own brown-hematite and large imports of fine Spanish ore at Newport, Merthyr-Tydvil, Swansea, and Cardiff. The nearness of the Cornish tin, and the inclusion of palm-oil (a flux in the tin-plate industry) in the 'Severn' trade with West Africa, led to the district specialising in tin-plate.
5. The ironfield of which Rotherham is now the smelting centre, and the presence of excellent stone for grinding, made Sheffield specialise in cutlery, and command of the traffic converging on the plain of York developed railway-plant at Sheffield (rails) and Doncaster (locomotives).
6. Railway-plant is also important at other inland centres such as Birmingham and Wolverhampton, where a large proportion of the transport *must* be done by rail; and for the same reason these districts specialise in goods which demand much labour for little raw material, *e.g.* pins, pens, needles, screws, nails, watch-springs, bicycles, etc.
7. Division of labour again leads to minute specialisation. For instance, railway-plant is a speciality at Crewe (locomotives) and Barrow (rails), which command the approaches to the Lancashire plain—at Derby, which commands traffic round the Pennines—at Swindon, where traffic routes *via* Gloucester and *via* Bristol converge on the Thames valley for London.

So, needles and fish-hooks are made at Redditch, keys and edge-tools at Wednesbury, enamelled ware at Bilston; locks and saddlers' ironmongery at Walsall, nails and chains at Cradley Heath, and all sorts of agricultural machinery at such agricultural centres as Lincoln and Grantham.

24 The woollen industry, which comes next in importance, has three special centres—the basins of the Yorkshire ~~Ouse~~, the Severn, and the Tweed.

1. The Yorkshire centre has four special advantages, in respect of transport, fuel, water, and climate. It is exceptionally well situated for collecting raw material (from the Pennine farms, and from abroad *via* the Humber), and for distributing the manufactured article, especially in European countries that have cold winters; it has supplies of good coal; water of the right quality is abundant everywhere; and the 'muggy' air of the lower valleys, especially of the Aire and the Calder, is very favourable to textile industry.

2. Leeds, which stands on a coalfield, with the water-power of the Pennines and excellent communication through the Pennine Passes and over the Yorkshire plain, is the centre of the woollen industry. Consequently, besides its large trade in broadcloth and other woollen fabrics, it makes a great deal of 'woollen' machinery—an industry shared by other towns in the Aire valley, *e.g.* Keighley
3. There is minute specialisation. Thus, Bradford, where the water is peculiarly suitable for dyeing, specialises in worsted and plush, alpacas and mohairs, Halifax in flannel and carpets. Huddersfield, like Leeds, makes broadcloth. Rochdale (Lancs), like Halifax, makes blankets. The central position of Batley is favourable for collecting wool 'waste' for shoddy. South Africa sends rather more and—in normal times—Turkey rather less than half the mohair; Peru sends nearly  $\frac{1}{2}$  of the alpaca, lama, and vicuña.
4. The 'West of England' tweed industry flourishes amongst the Cotswold sheepwalks on the banks of streams which are suitable for dyeing 'grain' colours, *e.g.* the Frome, and which flow past or across the Bistol coalfield. Stroud and Bradford are the chief centres—one of the special products of Stroud being scarlet cloth for military uniforms. Higher up the Severn valley, especially between the Welsh sheepwalks and the West Shropshire coal, there are smaller woollen industries, mainly in flannel, *e.g.* at Welshpool, and near the Birmingham coal there are carpet industries, *e.g.* at Kidderminster.
5. The Tweed basin is specially famous for 'cheviots' (named from the hills) and 'tweeds' (a corruption of *twilled*, confused with the name of the river). Its great advantages are in climate, hill-pasture, and fine soft water; its chief centres are Hawick and Galashiels.
6. There are various other 'machine' industries in the country, the most important being the hosiery of Leicester between the (long-wool) sheep farms of the oolitic escarpments and the Ashby coalfield, and the carpet industries of Kilmarnock and Ayr.
7. Hand-loom weaving is still carried on in districts where fuel and machinery are not easily accessible, of the 'Harris' and 'Irish' tweeds of the Hebrides and Connaught.

25 Next to the woollen in importance come various chemical industries, most of which are directly connected with local supplies of coal and salt.

1. The coalfields which have the densest population, and therefore the largest demand for gas, are the natural source of aniline dyes (a by-product of coal-tar).
  2. The salt of Cheshire is used with the Lancashire coal, as that of Cleveland is used with Durham coal, and that of Belfast with Glasgow coal, in the great alkali works of Widnes, Newcastle, and Glasgow.
  3. Glass-making from silica, salt, and other products is an important industry on the Lancashire coalfield, especially at St Helens, on the Durham coalfield, especially at and round Newcastle, and in the 'Black Country,' especially at Stourbridge. Salt is used also to make a 'glaze' for pottery at Worcester.
  4. Soap-making employs so much tallow and vegetable oil—especially palm, coco-nut, and cotton-seed—that it is mainly confined to coalfields near ports which have regular trade with tropical and semi-tropical countries, *e.g.* Glasgow, Birkenhead (Port Sunlight), and London.
  5. Paper-making depends mainly on vegetable 'fibres' (§) or textile 'waste' and rags. The Dalkeith coal, the quality of the water, especially in the Esk, and the import of wood-pulp from Norway, maintain the paper industry of the Edinburgh district, *e.g.* at Penicuik; the pure water from the Chiltern Hills and the North Downs, and the imports of pulp and esparto into London, support the paper industry of Hertfordshire, Buckinghamshire, and Kent (especially at Maidstone); the textile 'waste' of the cotton and linen coalfields are used in the (fine) paper mills of Darwen and Bacup.
  6. Tanning is a natural industry in the neighbourhood of good cattle-pastures. Thus, the cattle-pastures of the Central Plain gave rise to the great leather industries of Stafford, Leicester, and Northampton (cf the Maybole leather and the Ayrshire pastures), the enormous imports of hides and skins into the Thames account for the very large leather industry of London.
  7. Sugar-refining is carried on at most of the large ports in coal areas, especially those which have a historical connection with the West Indies, *e.g.* Bristol and Greenock.
26. Amongst minor textile industries those in linen, jute, hemp, and silk are most important
1. There are three linen districts—Ulster, the eastern end of the Scottish Lowlands, and Yorkshire; and in Ulster and



Yorkshire, where part of the raw material is a home product, there are subsidiary industries in linseed-oil and oil-cake. Belfast is far the most important centre, especially for fine goods, *e.g.* lawn and cambric; but other Ulster towns which have suitable water for bleaching, and can easily import coal from Ayrshire and Cumberland, *e.g.* Lisburn and Lurgan, are important.

2. The 'insular' climate of the Fife peninsula, the nearness to the Fife coalfield, and the easy access to supplies of flax from the Baltic, are special advantages to the Scotch industry. Dunfermline makes enormous quantities of table-linen; Kirkcaldy specialises in linoleum, and the Forfarshire ports, *e.g.* Dundee, Arbroath, and Montrose, make canvas and sailcloth.
3. The Yorkshire industry has the advantages of local coal, good water, and supplies of flax; and it can easily import Russian and Belgian flax. But the climate is not so favourable to fine work as in Ulster or Fife, and the dearth of hand-labour in England, as in Scotland, practically confines the making of linen lace to Ireland.
4. Jute-sacking for bags and hemp-spun cordage are made specially in the Forfarshire ports, the jute coming entirely from Calcutta, and the hemp coming mainly from Poland. Rope-making is a typical industry in nearly all seaports, especially those nearest to the Baltic, *e.g.* Sunderland and Hartlepool, of the net-making industry of Yarmouth.
5. The manufacture of silk is found chiefly in towns south of the main cotton and woollen districts, near to the Pennine coalbeds, and possessing suitable water for dyeing, *e.g.* Macclesfield, Congleton, Leek, and Derby. Coventry has a special industry in silk ribbons, and Bradford makes silk-*'waste'* into plush.

27 Most of the other important industries are connected with the home distribution of plants or minerals.

1. The fruit of the 'Home Counties' supports the jam industries of London, as the fruit of the lowlands along the Tay (especially the Carse o' Gowrie) supports those of Dundee (famous also for marmalade).
2. Special qualities of butter and cheese are made in Ayrshire, Cheshire, the Midlands, and the Severn valley (cf p 30); and the wheat-lands of the Great Ouse basin supply straw for the straw-plait industry of Luton and other villages of Hertfordshire and Buckinghamshire, as Norwich draws its supplies of mustard from the fenland of the same basin.



BRITISH ISLES (RAILWAYS).

3. The juice of apples is made into cider, specially in Devonshire, Somersetshire, and Herefordshire, as the juice of pears is made into perry in Worcestershire. Beer is brewed in the three capitals, London, Edinburgh, and Dublin (stout=beer made with burnt sugar), and at other places with special advantages, *e.g.* Burton, where the water is suitable, and hops and barley can be easily obtained. The best whisky is distilled in barley districts where the water is 'peaty,' and where peat can be easily procured for 'smoking' the product (cf. p. 26).
4. The presence of gypsum and other earthenware materials round Burslem, Stoke, Hanley, and other towns in the Upper Trent valley made them famous for pottery (cf. the porcelain 'earths' of Derby and the oolitic flint of Worcester). Other special products are the tobacco-pipes of Broseley, the 'Portland' cement (chalk and clay) of Lyme Regis, the 'Bath' brick (sand and clay) of Bridgewater, the Fuller's-earth of Reigate, the flagstones of Thurso, the granite of Aberdeen, Peterhead, Mt Sorrel, and Shap, and the slates of Llanberis, Festiniog, Bethesda, etc.
5. There are also several other 'animal' industries besides the leather (cf. p. 37), *e.g.* the combs and other horn articles of Aberdeen, and the gloves of Yeovil, Worcester, and Woodstock.

#### NOTE ON HOME OUTPUT OF IRON-ORE

1. Of the Home output of ore the average yield of the various iron-fields is—

Cleveland fields, over 41 p.c. (with 30 p.c. of metal)					
{	Northampton	"	"	14	"
{	Lincoln	"	"	14	"
	Furness	"	nealy	11	"
{	Northampton	"	over	6	"
{	Scotland	"	"	6	"
					(largely mixed with coal).

2. In 1906 both we and the Germans imported *c.* 7,000,000 tons of iron ore, but by 1913 our imports had dropped to nearer 6,000,000, while theirs had risen to 20,000,000, with the result that they exported 26,000,000 *more* tons of 'iron' goods in 1913 than in 1906, while we exported only 14,000,000 *more*.

## EUROPE—PART II.

### Continental Area.

1. EUROPE is the smallest of all the six continents except Australia, but the most populous of all except Asia; and this pre-eminence is due mainly to five geographical advantages:

1. It lies almost entirely within a temperate zone, free from extremes both of heat and cold, of damp and drought
2. It lies near the centre of all the land of the world, which gives its inhabitants great opportunities for trade.
3. It has a very long coast, broken up by innumerable bays and seas, which enables this trade to be carried on by water
4. It has an abundance of rain brought to it by regular south-west winds—'Anti- Trades'—off the Atlantic Ocean, which enables full advantage to be taken of the fertile soil.
5. It has great mineral wealth, especially of the two most important minerals, coal and iron, which provide fuel and machinery, and which are fortunately found side by side.

2. Two-thirds of Europe consists of a Great Central Plain, which stretches from the Bay of Biscay to the Ural and the Caucasus Mountains

1. It is so level in its eastern half that it is possible to travel from Cologne to Perm without going through a single tunnel. Most of the commerce in this half, however, is done by river and canal.
2. The western half, from Cologne to Bordeaux, is undulating, and is even broken by hills—the Vosges and the Ardennes; but communication in this half is mostly by rail, though the canal systems, especially in France, are excellent.

3. The mountains have the general direction which is characteristic of all the chief mountain systems of the Old World, *i.e.* east and west.

1. As the Scandinavian Mountains are highest and broadest in the south—*i.e.* the warmest latitude—they form a very great obstacle to the warm south-west winds. And, as they are so high and so near the sea, they meet the wet winds at their wettest, which causes the fall of rain and snow to be very heavy. This accounts for the huge glaciers and the innumerable streams that flow from them. They are destined to be the most valuable source of water-power in Europe. Cf. p. 60
  2. The Pyrenees are a double chain of broad, high mountains. As there are no tunnels through them, and no good passes across them, they form a practically impassable barrier between France and Spain. All communication by rail between the two countries has, therefore, to be carried on round the ends of the range, *i.e.* through Bayonne and St Sebastian or through Perpignan and Barcelona. Cf. Carlisle and Berwick
  3. The Carpathians form a huge semicircle of nearly 1000 miles in length, protecting Hungary from foes and from the cold north-east winds. The Jablunka Pass is a very useful depression, through which the main line of rail from Buda-Pesth to Breslau goes.
  4. The Caucasus has a similar depression in the Danel Gorge, by which the Russians invaded and conquered Caucasia, and which is now the chief trade-route of the district. The direction and the great height of the range cause it to have a very marked effect on the climate of the country to the south of it.
4. The Alps are the backbone of Europe. They are composed of various ranges which circle round the north of Italy, protecting it from cold winds and from enemies.
1. The valley passes used to be very important, especially those of Mont Cenis, Little St Bernard (Hannibal's route), Great St. Bernard (the Pilgrim route to Rome), and the Simplon (the first carriage route), and they all converge, like the spokes of a wheel, on Turin. This made it much easier to invade Italy from France than to invade France from Italy.
  2. The importance of the passes has decreased very much, however, since the cutting of long railway tunnels through the mountains. The Mont Cenis tunnel, which is  $7\frac{1}{2}$  miles, is the 'Overland Route to India' *via* Turin, the St Gothard, which is  $9\frac{1}{4}$  miles, connects Genoa *via* Milan with Switzerland and the Rhine valley; the Simplon is  $12\frac{1}{2}$ .

3. Five important rivers rise in the Alpine glaciers—the Rhine, Rhone, Po, Inn, and Adige. The water-power of these rivers has made Switzerland and Italy manufacturing countries in spite of the great lack of coal.
5. The general water-parting runs from the south-west to the north-east, and has two great centres—the Alps and the Valdai Hills.

1. The Alps are very high, and have seas near them on every side except one, therefore, they have a very heavy rainfall. The Valdai hills are very low, and are very far from sea except on one side, therefore, they have a very light rainfall. The rivers which flow from the Valdai area are very long and very slow, the rivers which flow from the Alpine area are—except the Danube—shorter and much more rapid.
2. The rivers generally run parallel with the mountains,<sup>1</sup> and do not try to break across them, and, therefore, they are generally navigable for the greater part of their course. They also radiate in all directions from common centres, and the character of the surface allows their lower courses to be interconnected by canals. For instance, the Rhine, Rhone, Ticino (=Po), and Inn (=Danube), all rise within 40 miles of each other, and empty hundreds of miles apart. Both the Black Sea and the Caspian are connected by river and canal with the Baltic, both the Black Sea and the Baltic with the North Sea; both the North Sea and the Caspian with the Mediterranean.
3. On the other hand, the rivers in the south get very little rain in summer, and those in the east get very hard frost in winter, and the increase in the size of modern ships necessitates constant dredging, even in rivers that enjoy the 'scouring' advantage of a tide. Many of the short rivers, and some even of the long ones, especially in the Alpine Area, are too quick for navigation. In the latter case they may still be useful, however—for irrigation, as in Spain, for mechanical power, as in Switzerland, or for timber-floating, as in Sweden.
4. The Seine is so useful that Rouen has the best position for trade of any single city in continental Europe. The reasons for this are that the river rises at a low level, and therefore is slow; it flows through porous soil, which is able to moderate its floods and regulate its volume, and it is

<sup>1</sup> There are two important exceptions to this—the Elbe in the north-west corner of Austria, and the Danube in the south-east corner.

connected by canal with the waterways of neighbouring countries at more than a dozen separate points.

- 5 The Rhine—like the Elbe, which is navigable up to Prague *via* the Moldau—is a really international highway of commerce, with a fertile basin; and it has, therefore, along its banks probably a greater number of important cities for its size than any other river in the world.

*NB*—The older cities, such as Coblenz and Cologne, are all on the left bank, which had the protection of the river itself against the Teutonic hordes.

- 6 The Danube does for the trade of south-eastern Europe what the Rhine does for the trade of north-western Europe. Like the Rhine, it has deposited a large, damp delta, but, unlike the Rhine, it has no tide to help in keeping its mouth free from mud. Like the Rhine, too, it has a very fertile basin—famous for timber, wine, grain, and pigs.

*NB*—The old obstruction of the 'Iron Gates' at Orsova has been largely removed by the cutting of a ship-canal through the solid rock.

6. An important climatic influence is exercised by warm currents of wind and water, and the typical summer-drought of the Mediterranean basin is usefully complementary of the summer-rain of the North European plain.

1. Besides the distinct warm current of the Gulf 'Drift'—the influence of which is often overrated—there is also a general drift of warm surface-water from the Equator, which is deflected towards Europe, partly by the rotation of the earth and partly by the south-west Anti-Trade winds.
2. These winds are of enormous importance for the carrying of moisture inland. The average rainfall is over 40 inches in Western Europe, but under 20 inches in Eastern Europe; at Bergen it is over 7 feet a year, while at Petrograd it is under 2 feet.

This is very advantageous for such operations as spinning, but not good for such as milling. Thus, the spinners of Pilsen and Brunn need to charge their mills with vapour artificially in order to compete with those of Manchester and Leeds, but English millers cannot make good 'Hungarian' flour even from the best Hungarian wheat.

It has also a marked effect on vegetation. Thus, the wet side of nearly all the mountains produces timber, while the dry side produces pasture; the dry climates produce grains, while the damper produce roots, *e.g.* Norwegian pine and Silesian wool, Pomeranian potatoes and Hungarian wheat.

7. The vegetation may be roughly classified as Arctic, Mediterranean, and Intermediate.

1. The Arctic Region is practically the Tundras, and produces only mosses and lichens—sufficient food for reindeer. Cf p 9.
2. The Mediterranean is the region of dry, sunny peninsulas and islands. The characteristic plants of the peninsulas have leaves or roots specially suited to drought, the characteristic plants of the islands and of the coastlands of the peninsulas are fruits, *e.g.* Maltese oranges, Sicilian lemons, Corfu citrons, Barcelona nuts, Greek currants, Almerian grapes, Turkish figs, Servian plums, Tuscan olives.

*NB*—Laurels and other evergreens have thick leaves in which to store water, and vines have long roots with which to draw up water from great depths.

- 3 Between the Arctic mosses and the Mediterranean evergreens there is a region of deciduous trees, ordinary grains, and the vine. The chief trees are the oak, beech, and ash; the chief grains are wheat, oats, and rye. The vine is grown largely—for wine—on the sunny slopes throughout Central Europe, *e.g.* at Tokay, Epernay, Reims, etc. Fibres, such as flax and hemp, flourish on the sites of old forests throughout this region, *e.g.* in Russia and the Low Countries.

8. Continental Europe is rich in minerals, especially coal and iron, the most important of all minerals.

1. The coalfields of Europe are small and scattered, and the seams, though numerous, are thin and hard to get at; and this affects the price of the coal. But, fortunately, in most cases the coal is found quite close to the iron and to limestone (for 'flux' in smelting).
- 2 The coal is mined in the largest quantities in Germany, Austria, France, Russia, and Belgium,—Germany producing, mainly in the Rhine basin, about twice as much as Austria and France together. Cf p 14.
- 3 The largest amount of iron at present is mined in France, Spain, and Russia, but the richest ores are in Sweden, Spain, and (East) Russia. Cf p 14.

*NB*—Belgium is an important manufacturer of iron, but has to import ore. In 1913 Germany got 21 out of her total 28½ million tons of iron-ore from Lorraine!

9 Other minerals are oil, china-clay, silica, and salt, copper, lead, zinc, gold, silver, and mercury.



1. The oil comes chiefly from the Caucasus district, especially from Baku, where it is extremely useful as fuel for the steamers on the Caspian Sea. It is also fairly abundant in Galicia and Bukovina.
  2. The china-clay, or kaolin, is found chiefly in Saxony and France, especially near Dresden, Sèvres, and Limoges. The silica—for glass-making—is very widely spread, but the most important deposits are in Bohemia and Belgium. There are also rich deposits near Venice and near Paris.
  3. Salt—for food, agriculture, and chemicals—is evaporated round the coasts of France and Spain, quarried all over the Steppes of Russia, and mined on a gigantic scale in Austria, especially near Cracow.
  4. Spain produces the most and the best copper; Germany, its only rival, produces nearly a quarter of the amount produced by Spain. Spain is much the largest producer of lead, with Germany second. Germany also produces half the zinc in the world, and there are also large deposits of the metal in the Moresnet corner of Belgium.
  5. The 'precious' metals are practically monopolised by Russia and Germany, Russia producing nearly all the gold, and Germany producing the larger part of the silver. Hungary produces some gold, and France, Austria, and Spain produce some silver. Mercury is found in Spain at Almaden, and in Austria at Idria; and the Idrian supplies are very useful in connection with the Hungarian gold.
10. Europe is well provided with animals and fish.
1. Cattle are most numerous in Russia and Germany, but most important in Denmark and Holland, sheep are most numerous in Russia and France, but the best wool comes from Spain and Germany (Saxony and Silesia), pigs are most numerous in Russia and Germany, but they are very important in the Lower Danube basin, especially in Servia.
  2. Reindeer are used as beasts of burden round the White Sea, camels round the Caspian, and donkeys round the Mediterranean, horses are most numerous in Russia, but the Flemish and Andalusian breeds are very famous.
  3. Cod and herring are caught in the North Sea, tunny and sardines in the Mediterranean; salmon are caught in the north-western rivers, and sturgeon in the south-eastern, the most famous oysters are those of Arcachon and Brittany, or Ostend and Texel. Cf. p. 13.

### France.

1. THE three coasts have great commercial value, because they face in different directions

1. As an inland sea, the Mediterranean has neither the advantages nor the disadvantages of perceptible tides, but the cutting of the Suez Canal converted it into one of the main trade-routes of the world Cf p 21
2. The French routes to the East and the Southern Hemisphere are obviously shorter than the English or the German, and this accounts for the pre-eminence of Marseilles as a port, in spite of the stormy nature of the Gulf of 'Lions.'
3. The Bay of Biscay is equally stormy, and the French coast, especially between the Gironde and the Adour, is very deficient in harbours. This, however, increases the importance of the estuaries, cf Bordeaux (Pauillac and Blaye) and Nantes (St Nazaire), though harbour dues are very heavy
4. The estuary of the Seine is even more important, though—like all the other French ports—neither Havre nor Rouen stands on a coalfield. And the cross-channel traffic has necessitated the development of 'artificial' ports at Calais, Boulogne, and Dieppe, as the wool-trade of the Ardennes and the fisheries of the North Sea have necessitated the development of Dunkirk
5. The fisheries on the Bay of Biscay north of the Gironde, especially oysters and sardines, have given a commercial importance to the great naval-station and cable-terminus of Brest, as those on the Channel east of St Brieuc (oysters) have to the naval-station of Cherbourg

2. The general slope is from south-east down to north-west; but a line from Bayonne to Sedan divides the country into a low and level western, and a high and hilly eastern, part.

1. The valleys of the Moselle ('Orient Express' route) and Doubs, the strip of lowland between Sedan and Dunkirk, and the Mont Cenis Tunnel, are of immense value to French trade, especially as the general trend of the rivers, and the

low level of the west, allow a quarter of the internal trade to be done by water. The result is that France 'forwards' an enormous quantity of freight between the New and the Old Worlds, and between England and Continental Europe, especially Switzerland.

2. The Seine is navigable by river-boats to Troyes, and is joined by the Marne canals to the Rhine; the Loire is navigable to Nevers, and is joined by canal to Châlons-sur-Saône, the Garonne is navigable to Toulouse, and is joined to Marseilles by a canal *via* the "Swiss" port of Cette.
3. Generally speaking, the climate is temperate and the soil is fertile. Of course, Brittany is damper than the basin of the Garonne, which is protected from the south-west winds by the Pyrenees, or than the basin of the Marne, which is farther from the sea. So, too, the plain of Normandy, which is exposed to the dry east wind, has much greater extremes of climate than the sheltered Rhone valley has; and the chalk slopes of Champagne are less fertile and less warm than the volcanic slopes of Guienne.

### 3. The vegetation corresponds roughly to three climatic belts.

1. For about 100 miles inland from the English Channel there is a belt of pasture and orchards almost right across the country (cf. Breton, Perche, and Flemish horses; Normandy cider, pippins and butter, Camembert, Neufchatel and Brie cheese, the flannel and billiard cloth of Elbeuf; and the carpets and tapestry of Beauvais). In the east, where the presence of coal attracts a denser population, and habits are more Teutonic, hops are grown to supply the large demand for beer, and colza is grown for oil.

*NB*—Chicory is grown between Abbeville and Boulogne.

2. In the dampish heat of the lower Rhone valley, maize, mulberry, and olive flourish (cf. the oil of Provence and the silk of Lyons), and the coast-lands produce oranges and lemons.
3. The rest of the country produces wheat and wine—wheat on the dry, warm plains in the basins of the Seine and the Loire, and wine on the dry, warm slopes of Champagne, Burgundy and Guienne (cf. p. 17). And the dry air, abundance of grain, and limestone formation of the small Normandy farms, encourage an enormous poultry industry, mainly to supply the English market with eggs and chickens.

*NB*—Reims, Sillery, and Epernay are in Champagne; Dijon, Macon, Chablis, and Beaune, in Burgundy, and Medoc, St. Emilion, Sauterne, and Cognac are near Bordeaux. The Loire wine is inferior, cf. Saumur.

- 4 The valley of the Garonne produces fine crops of flax, hemp, and tobacco, though Government monopoly restricts the area, and increases the price, of the tobacco. Flax and hemp are produced also in the Sarthe valley, and supplies of both are imported from Belgium and Russia.

*N B* —Fibre-‘waste’ is made into paper round Angoulême.

5. The chief roots are potatoes and beet, the potatoes mainly in the west, and the beet on the north-east coalfield, where it can be easily converted into sugar and alcohol. The N.E. is also famous for market-gardening, especially round Laon.
6. Forests, which supply the mass of the domestic fuel, cover most of the hilly districts, especially the west, *i.e.* the wetter, side of the mountain ranges; the drier side, especially in the upper valley of the Garonne, is devoted to sheep pasture, cf. the Roquefort (ewes-milk) cheese of the Aveyron district, which is also famous for its mules

#### 4 The chief minerals are coal, iron, and salt.

- 1 The coal comes almost entirely from (1) the Belgian frontier, *e.g.* from round Lens, Denain, Anzin, and Valenciennes, and (2) the eastern and south-eastern highlands, especially from round Creuzot, St Etienne, and Alais
- 2 The latter was the only part of France where coal and iron were found together, but the whole Sarre coalfield, as well as the whole Lorraine iron-field, now belongs to France—Nancy, not Metz, being still the natural centre. Large quantities are also imported from Algeria and Sardinia
3. Nancy is also the great producer of rock-salt; but two-thirds of the salt produced comes from the brine-pans along the coast, especially between the Loire and the Gironde and between Cette and Marseilles

*N B* —The famous phosphoric chalk comes almost entirely from the Department of the Somme.

5. The largest towns and industries are generally on or very near the coalfields; but, owing to the scarcity of coal, the French manufactures are much scattered, and half the population is engaged in agriculture.

1. The high standard of comfort, and the excellent transport, make wheat-bread the staple food, the light wine of the country—*vin ordinaire* —is the staple drink
2. The high standard of comfort also affects the cost of production; but, in any case, the manual skill and natural taste of the people tend towards the production of artistic

and highly finished articles rather than to a large output of cheap 'machine' goods

3. The high price and 'personal' excellence of the typical products—*e.g.* costly textile, leather, and metal goods—keep them more or less outside the range of ordinary mercantile competition, and give them a constant market.

6. Agriculture is much the most important industry, and has several dependent industries besides those already mentioned.

1. The wheat districts have an important industry in various 'alimentary pastes,' *e.g.* macaroni and vermicelli; the beet-sugar districts refine sugar and distil quantities of alcohol, besides sending raw sugar to the refineries in the great ports—Marseilles, Havre, Bordeaux, etc.—where coal can be easily imported; Toulouse has large tobacco factories; the olive-oil districts use their oil 'waste' in soap, scent, and candle industries, especially at Marseilles (near the great 'flower' district of the Var), where oil-seeds can also be easily imported. Cf. the import of hard wheat for the great macaroni industry of Marseilles.

2. In the woollen districts such encroachments have been made on the old pastoral area by the plough, that the price of meat has risen, and the amount of wool and skins produced at home has greatly decreased. Consequently, the import of wool and skins has greatly increased. Most of the wool and sheep-skins enter through Dunkirk, the port nearest to the chief sheep district (cf. the import of flax and silk); but goat-skins ('morocco') from North Africa and the Levant naturally enter through Marseilles or Bordeaux.

*N.B.*—Wine-making, and dairy and poultry farming, are peculiarly suitable because of the smallness of the vineyards and farms.

7. The distribution of the three chief textiles—wool, silk, and linen—still depends, therefore, upon the home products; the distribution of the cotton industry has direct relation to the harbours near coal.

1. The woollens are made on or near the coalfields of the sheep districts—the Ardennes and the Cevennes. The main product comes from the N.E., from Tourcoing to Reims (shawls), and from Sedan to Amiens, but the great centre, especially for yarn and cloth, is Roubaix. Roubaix is also, like Paris and Beauvais, famous for carpets, and Elbeuf for tapestry.

Lyons is the chief centre in the southern district, and specialises in shawls; but the climate, as in the German woollen districts, is less favourable to spinning yarn.

2. The silks are made on or near the coalfields of the mulberry district, where the water is suitable for dyeing. Lyons is the chief market, and specialises in 'broad goods', St. Etienne specialises in ribbons, and Avignon in light goods. In the more continental climate of the lowland-plain, Paris and Tours specialise in 'open-work' goods—gauze, tulle, hosiery (cf Nottingham). Calais is also a tulle centre.
3. The linens are made on the coalfields nearest to the flax districts—the Nord and Sarthe Departments. Much the larger amount is produced in the former, especially at Lille, Valenciennes ('valenciennes' lace) and Cambrai ('cambric'), because of the special advantages of the coal-supply and access to the Belgian flax. But there is a little coal in the Sarthe valley, e.g. at Le Mans, and the particular product of the district, the *Point d'Alençon*, is a needle lace.
4. The cotton industry is located mainly in the great 'Atlantic' and 'Channel' port of Rouen, which can easily import U.S.A. cotton and English coal, and which is the greatest canal-and-railway junction in France; but Lille and Amiens are also important centres. And the import of Egyptian, Turkish, and Indian cotton through Marseilles supports a cotton industry on the nearest coalfield—round St. Etienne.
8. The most important 'animal' industries next to the wool and silk are in leather and gloves
  1. Leathern goods of all sorts are made in the Seine, Garonne, and Rhone valleys, where skins can be most easily imported. Paris and Marseilles specialise in shoes and real *kid* gloves; the latter are also a special product in the Alpine goat-districts, e.g. at Grenoble, and boots and shoes also at Toulouse. The largest tanning centre is Annonay, which also manufactures paper. Cf Angoulême.
9. The chief 'mineral' industries are in connection with iron, china, glass, and the precious metals.
  1. There are three chief 'iron' centres, Lille, Nancy, and St. Etienne. In both districts railway-plant is important, especially at Fives (a suburb of Lille) and Creuzot, the latter being in the only part of France where coal and iron are found together. Textile-machinery and military-plant are also made in both these districts, the machinery mainly

at Lille and St Etienne, and the cannon, ammunition, etc., mainly at Creuzot, which is close to the lead mines of the Cevennes plateau.

- 2 Limoges and Sèvres (Paris) produce the finest china, and Baccarat and Paris are famous for glass. On the coalfield between the two great wine areas, St Etienne specialises in bottles. The possession of good stone for grinding encourages cutlery industries, *e.g.* at Langres, as the Auvergne sulphur encourages match industries, *e.g.* at Clermont; the nearness to the olive country makes Marseilles the chief centre for tinning the sardines and anchovies of the Gulf of Lions, Besançon has numerous 'Swiss' industries, especially watch-making; Lyons and Clermont-Ferrand have various 'electric' industries, *e.g.* motors, Bordeaux being the great rubber port.
- 3 Paris is also the chief centre for artistic work in gold, silver, bronze, etc., and has easy access by water to the cabinet wood of the Compiègne and Orléans forests, it is very famous for all sorts of 'confectionery,' including pâtés, but its special 'partridge (and truffle) pâtés' are made in the truffle district of Dordogne, especially at Périgueux.

*NB* —The loss of the Sarre coalfield does not reduce the German output by  $\frac{1}{10}$ , while it increases the French output by  $\frac{1}{2}$ ; but the loss of the Lorraine coalfield is a staggering blow to Germany.

### Luxemburg.

1. The Grand Duchy of Luxemburg, which is no longer a member of the Zollverein, has always been geographically much more akin to Belgium than to Germany.

1. Its dry sunny hills towards the Moselle valley are a good site for vineyards, but the chief industries are pastoral and mineral—glove-making and iron-mining.

*NB* —Germany imported 5/6,000,000 tons of iron-ore from Luxemburg annually, and practically controlled the whole of the smelting industry.

## Belgium.

1 BELGIUM has great advantages for transit trade especially between France or England and Central Europe, and these advantages centre on Antwerp

- 1 The low, unbroken coast has no good harbour, though Ostend is a busy packet-station, but Antwerp is a magnificent river harbour, Ghent is a large canal port, and both Brussels and Bruges (outport, Zeebrugge) have access to the sea by canal
- 2 The low, level frontiers to east and west offer every facility for international rail, river, and canal traffic, and the low level surface gives similar facilities for internal trade, especially by canal—the canals doing drainage and irrigation (*e.g.* in the sandy Campine) as well as freight work

*N.B.*—The 'voluntary negligence' of the Dutch on the Maas and on the Terneuzen canal has terribly hampered Belgian water transport.

3. The bilingual character of the people, which is natural in a 'Buffer State,' and used to be a great obstacle to good government and education, is now an advantage for trade.

2 The surface encourages manufactures rather than agriculture, though a good deal of rain falls in April.

1. The polders had to be reclaimed from the sea and protected with dykes, and the Campine had to be drained and carefully fertilised by spade-culture, before they were productive.
- 2 The area is too small to be of much importance in the world's agriculture, or to have much variety of climate; it is too low and level to have much rain in summer, and so much exposed to 'continental' influences that it has severe winters.
- 3 The most fertile part of the country originally, the Meuse valley, is so rich in minerals that it attracted the mass of the population. Now, with great mineral wealth, dense population, skilled labour, and large accumulations of capital, Belgium is essentially an industrial country

3. The mineral wealth of the Ardennes Hills has developed great industries in the Meuse and Sambre valleys.



1. It may be divided into quarry products, *e.g.* building-stone, marble, lime, and slate (especially at Neufchateau), and mine products, *e.g.* coal, iron, and zinc
2. The coalfield stretches right across the country between Fontenoy and Verviers, but is richest in the Sambre valley, especially round Mons and Charleroi; and, as both lime and iron are found with the coal, there has been every facility for developing the iron and steel industry. Liège-Seraing is the great iron centre, being specially famous for firearms and machinery (tools), railway plant and general hardware. Mons and Charleroi also make machinery and tools, Namur and Charleroi make especially wire and nails, and Brussels and Verviers make railway-plant
3. Between Moresnet and Verviers are some of the richest zinc mines in the world, and copper and lead are also mined between Verviers and Liège. Indeed, the Seraing suburb of Liège is one of the most important metallurgic centres in the world (cf. Creuzot and Essen)

*N.B.*—The zinc field is now entirely Belgian.

4. The coal, as usual, attracts other 'mineral' industries, for it is cheaper to carry the metal to the coal than the coal to the metal—4 tons of fuel may reduce 1 ton of metal, and 4 tons of metal may bulk=1 ton of fuel. Thus, Liège has very large glass and chemical works (cf. Newcastle), and Jemmapes has large pottery and chemical works

4. The fuel and machinery have greatly encouraged the development of textile industries—founded mainly on two home products—wool and flax.

1. The 'continental' climate and the limestone pastures in the Ardennes were very favourable to the production of good wool, and the people 'inherit' centuries of experience and manual skill from the old Flemish spinners and weavers. Verviers is the great centre, with subordinate centres in Dolhain, Limburg, and Brussels (carpets).

*N.B.*—Nearly all the wool used now is Argentine.

2. Linen has replaced woollen industries in Flanders, partly because of the suitability of the alluvial soil and damp climate for growing flax, and partly because the absence of lime salts makes the water of the Lys and other rivers peculiarly suitable for cleansing the fibre. Ghent is the great centre, with subordinate centres in Courtrai, Brussels, Bruges, and Mechlin, the three last being specially famous for lace. Courtrai uses (coarse) Russian flax.

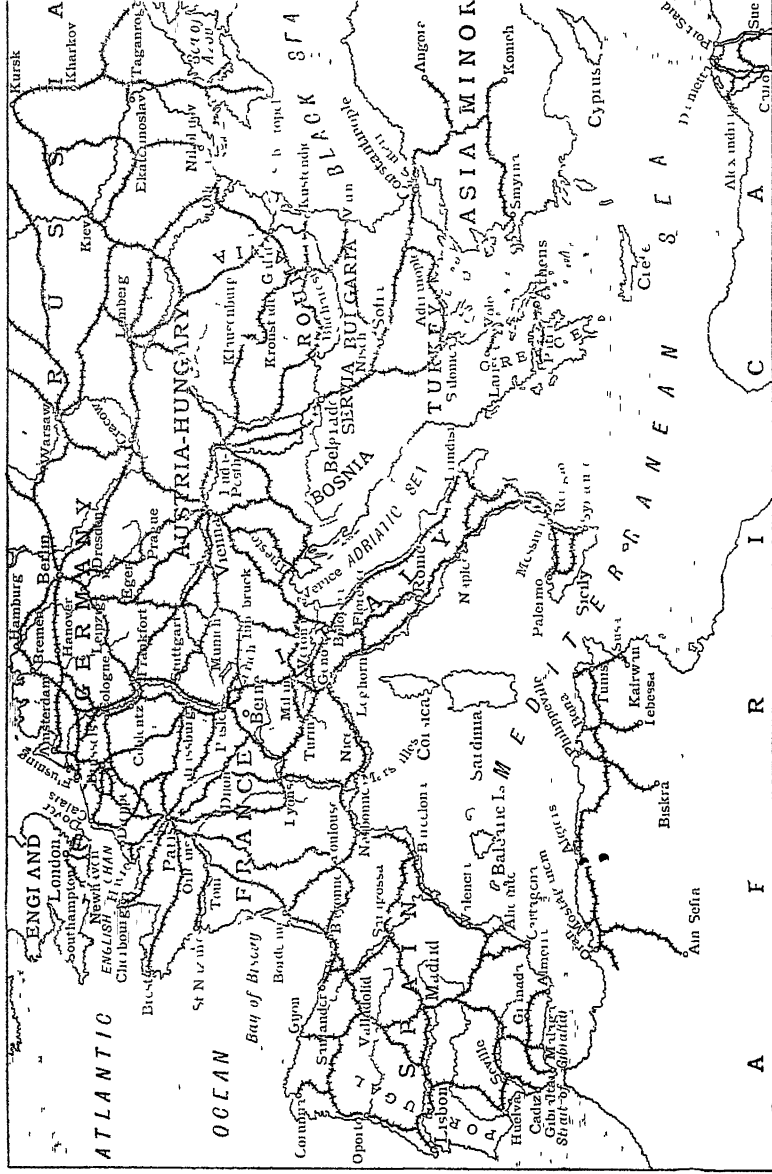
- 5 The ease of importing cotton up the Scheldt has developed cotton industries at Ghent and other Flemish towns, especially Courtrai and Tournai. Some of the product, like the woollen and linen products, is very fine, but the connection of Belgium with the Congo makes a constant demand also for coarse cheap goods. (Cf 'Antwerp' ivory and rubber.)

5. Most of the other important industries are connected with home products, mainly vegetable.

1. Both sugar and alcohol are made from beetroot, grown along the north edge of the coalfield, especially along the upper Senne. The chief refineries and distilleries are in Antwerp, where potatoes and various cereals are used as well as beetroot for distilling purposes.
2. The cereals for this distilling and for foodstuffs are partly home products; wheat and barley are grown in the driest parts of the plain, *i.e.* the centre, and rye in the damper parts, *i.e.* the Campine and the Scheldt basin. Consequently, while the rye gravitates naturally, like the potatoes (which are very largely used for food), to Antwerp distilleries, the barley gravitates to the famous breweries of Louvain and Brussels, which draw hops from Hainault.
3. Hemp and colza are grown in the flax district, and there is a busy industry in linseed and colza oils, especially round Ghent. Chicory is grown between Bruges and Dixmude.

6. Purely agricultural products are also important, Belgian agriculture being exceedingly scientific and intensive.

1. There are fine cattle-pastures in the Campine, from which there is an export of very good butter and excellent hay.
2. Splendid draft-horses ('Flemish' and 'Norman') are raised in Flanders and Brabant, which also export good hay. The chief horse-market, however, is Liège, on the edge of the great oats district of the Ourthe basin, where the dense population eats large quantities of horse-meat.
3. The smallness of the farms, the abundance of grain and lime, the 'continental' climate, and the nearness to the London market, give special prominence to poultry-farming.
4. The denseness of the population encourages both the spread of market gardening, and the import of foodstuffs and raw materials, including building timber. Historical associations and water transport make Ghent a large timber market, with a special industry in church furniture.



CENTRAL AND SOUTHERN EUROPE.

## Holland.

1. THE character of both the coast and the surface has made the Dutch essentially a commercial people

1. The coast includes the mouths of three of the busiest rivers in Europe—the Rhine, Maas, and Scheldt, all of which are absolutely free, international trade-routes, and the line of islands which mark the old coast, is a great protection. Since the opening of the ship-canal to IJmuiden, Amsterdam has made great progress; Rotterdam is the *natural* port of the Rhine valley, and exceedingly jealous of rivals.
2. The dead level of the surface gives every facility for commerce by river, rail, and canal. The river and rail traffic, especially the latter through Flushing and the Hook, is mainly international ('transit'); the canal traffic, except on the 'North-Holland' and the 'Sud-Guillaume,' is mainly local, the canals acting also as drains, irrigation-ducts, and 'hedges.'
3. The restricted area helped to drive the male population abroad, and the colonial empire is now the main source of the home commerce, *e.g.* the East India coffee of Amsterdam, and the West India cacao of Rotterdam.

2 Some of the peculiar features of the coast have had special results.

1. Its lowness exposed it to such inroads of the sea that it had to be protected by artificial stone-dykes wherever the natural action of the wind—on a very exposed shore—had not heaped up sand-dunes. This led to wide-spread 'reclaiming' of land, and from the reclaimed lands the best Dutch cheese ('Edam') comes.

*N.B.*—Even the Zuider Zee (made by the breaking-in of the sea in the 13th century) is now being drained, which will stop the shrimp industry.

2. The protection of the islands, the abundance of alluvial mud, and the necessary percentage of fresh water, combine to make an ideal site for oyster-beds; while the character of the out-shore water favours the swarms of sprats on which the Dutch 'anchovy' trade depends.
- 3 The entire absence of any elevation to act as an effective 'condenser' causes the air to be very damp, and the sky to

be constantly clouded, without any heavy precipitation of rain or snow; and this makes the climate peculiarly favourable to roots and fibres.

3. Some of these coastal features are curiously repeated in the surface features.

1. Nearly half the land is at, or below, sea-level, and therefore naturally marshy (and foggy), it is also so much exposed to river floods that the rivers are dyked as well as the coast. These marshes, however, when drained, make, as in Belgium, fertile polders, from which the best Dutch (Groningen) butter comes—*via* Harlingen or Delfzijl.
2. The dead level makes the winds so strong and regular that windmills, especially for drainage-‘pumps,’ are as numerous as they are useful; and it has immensely cheapened the construction of railways in every respect except the provision of bridges.
3. The exposure to the west winds makes the climate ‘insular’ in summer, while similar exposure to the east winds gives the ‘continental’ hardness in winter which is so valuable for cleansing and pulverising soil.

4. In such a climate, and on such a soil, the vegetation is naturally limited to grass, hardy grains, roots, and fibres.

1. The reclaimed coastlands and the polders raise a valuable type of horse, especially in Friesland, but their special value is as cattle pastures; and dairy industries suit a country like Holland, which has important colonies to attract its *male* population to commerce. Cheese is made specially at Edam (‘round’) and other places west of the Zuider Zee, Alkmaar being the great market; the butter is made specially at Groningen and other places east of the Zuider Zee. Margarine is made very widely, *e.g.* at Gouda, which is also famous for cheese (‘flat’).

*N.B.*—Sheep are numerous in the poor N E, of the ‘carpets’ of Deventer, and the general woollens of Utrecht.

2. Rye is the chief grain, and is grown mainly in Gelderland, especially round Arnheim, where the soil is suitable, and the climate is most ‘continental.’ It is mixed with wheat to make the favourite bread of the people, and is used in distilling the famous ‘Hollands’ gin at Schiedam and

Rotterdam, and in making curaçao liqueur (with the real Curaçao orange or the Seville 'substitute' from Spain).

*N.B.*—Amheim has breweries partly supplied with local hops

- 3 Both vegetable and flower 'roots' are grown in great abundance. The country is one of the largest producers of beet-sugar in the world, Rotterdam and Amsterdam being the great refining centres, the large beet and potato crops also help to support the distilleries, and Haarlem and Leyden are very famous for 'Dutch bulbs'
- 4 The soil and climate suit flax to perfection, especially between Tilburg and the North Sea. Tilburg itself and Haarlem are noted for their 'Brown *Holland*,' and the demand for really good flax for the Belgian lace industry brings high prices for the best Dutch fibre. Delft uses the linseed, as well as imported seed (cotton, etc.), in its oil industry, and paper is manufactured at Apeldoorn

- 5 A little poor tobacco is grown in the great fibre district, but the tobacco and cigar factories of Rotterdam, Amsterdam, and Utrecht use mainly East Indian leaf ('Sumatra')

*N.B.*—The greatest defect, as in Belgium, is want of timber, but abundant supplies can be imported by sea from Scandinavia and Russia, or down the Rhine from the Black Forest. Cf. the timber industry of Dordrecht

5 In a 'delta' formation, there can be no mineral wealth except clay and peat; but a little coal is mined in the Limburg hills.

1. As all stone must be imported, there is a great demand for tile and brick (especially for road-paving), and Delft still makes the earthenware which takes its name from the town. Zutphen makes tiles, and Gouda makes tobacco-pipes. The best peat is round Assen
2. The diamond-cutting industry of Amsterdam arose out of the Dutch connection with South Africa and their religious toleration for Jews; the tin trade of Rotterdam is supplied from the East Indies, especially Banka and Billiton.
3. The absence of minerals has, in modern times, practically ruined the old textile industries; but Utrecht is still a busy centre, and the cotton industry is carried on in Enschede, Almelo, Hengelo, and other villages of the Overijssel province, where both land and labour are very cheap.

*N.B.*—Proper international development of the three great rivers has been persistently thwarted by the Dutch!

### Scandinavia.

1. THE acute 'Home-Rule' question between Norway and Sweden sprang out of geographical conditions which have given the two countries very different histories, and will give them very different destinies.

1. The ice-free open ocean, the protection of the skerries to the inshore waters, and the great facilities for fishing, have made the Norwegians a race of sailors; the inexhaustible water-power of the fiord-torrents, the protection (from east winds) of the Kiølen and Dovrefield mountains, and the 'insular' influence of the S.W. winds, will make them one of the great textile-producers of the world

2. The 'continental' climate, the rapidity with which the fresh, inland water of the Baltic freezes, and the character of the rivers (*e.g.* for timber-floating and in carrying down soil) have made, and will continue to make, Sweden mainly a producer of raw materials.

2. The chief Norwegian industries are at present connected with fishing and with the forests which clothe the sides of the mild, moist fiords.

1. The fishing-ports are generally little towns or villages, such as Trondhjem, Stavanger, Tromsø, and Hammerfest, on the open ocean; the best fishing-grounds are off the Lofoten islands; the great central market is Bergen, which exports ice as well as fish (cod, herring, mackerel, salmon, etc.)

*N.B.*—Salmon-tinning is an important industry at Bergen and Stavanger; and the collecting of down and feathers is important in the north, especially at Hammerfest. The mercantile marine suffered terribly in the war—owing essentially to the German desire to cripple a great rival in the carrying trade

2 There are still large forests of pine and fir, which supply 'deals' and various subsidiary products, *e.g.* wood-pulp, and the river-water is very suitable for paper-making. Drammen and Frederikstadt have been the chief timber ports, but the more accessible supplies of timber—in the

south—are becoming exhausted, and the shipping-centres will move farther north

*N B.*—This will be accelerated by the richness of the iron deposits of Ofoten.

- 3 As the south is the highest, broadest, and wettest part of the country, it has the largest glaciers; and the south is also the most convenient part from which to export ice. Christiania is the chief ice-shipping centre

3 The industries of Sweden are more varied, and have little connection with the coastal features

1. On the Swedish side the great Scandinavian plateau falls to the Baltic in three distinct terraces. The northern end of the highest terrace is a belt of forest; among the hills in the centre of the second there is a belt of mineral wealth; and the lowest is capable of cultivation, though the latitude in most parts (above 60° N) gives a very short summer.
- 2 As the plateau itself excludes the mild west winds, and the relief of Europe exposes the eastern slope to the dry, bitter east winds from Siberia, the climate is entirely continental—for instance, Bergen has five times as much rain as Upsala. And this enables the timber to be cut and collected, as in Canada, during the winter, and to be carried down to the mills, sawn, and exported, when the rivers and the sea are free from ice

*N B.*—Over 3000 saw-mills are run by water-power from the rivers.

3. There are still in the north enormous forests of pine and fir, which supply timber and such products as pitch, tar, turpentine, bark, potash, furs and skins. Naturally, the busiest timber port will be the most southerly within the richest forest district—Gefle, which is the centre of all the timber industries, including the manufacture of wood-pulp and cheap furniture. The presence of sulphur within easy reach of the pith and potash of any forest area naturally led to a match-making industry, *e.g.* at Jonkoping and Goteborg (Gothenburg).
4. The low level, the latitude, and the water surroundings make Gothland suitable for hardy grains and roots; and the nearness to European markets draws exports to Malmo and Helsingborg. Oats are raised almost entirely for export, and rye for home consumption ('black-bread'); potatoes and beetroot thrive, the latter being used for alcohol as well as sugar.
5. The geographical conditions of Gothland are also very favourable to pastoral industries, and there is a large



export of butter—mainly from Goteborg. In summer, too, large numbers of cows are fed, as in Switzerland, up in the high valleys, for the dry climate does not encourage the forest area to encroach on the river-lowlands as in Norway. The presence of cattle pastures amidst conifer forests naturally leads to a large leather industry.

- 6 The presence of so much water in and round Gothland give better facilities than elsewhere in Sweden for textile industries and transport. Norrköping, on the Lake-Canal system, is the chief textile centre, Kalmar commands the chief paper-making district
7. The chief mining district hitherto has been the Dal-Arne, the two chief minerals being iron and copper. Both are found near Fahlun, and iron is found also near Eskilstuna and Gefle; but the special product of Dannemora (charcoal-smelted) makes such supremely good steel that it brings a higher price in Sheffield than any other

In the future, however, the largest supplies of iron are likely to come from the Gellivare district, where—in spite of the latitude—there is abundance of good timber for charcoal. It can now be exported even in mid-winter by the railway from Lulea to Boden—an ice-free port on Ofoten fiord, *i.e.* inside the Arctic Circle!—as Dannemora ore is exported in winter by the railway from Stockholm to Trondhjem.

*N.B.*—The cheapness of land, iron, and timber has greatly facilitated the construction of these railways

Besides the iron and copper, there are mines of silver and lead, *e.g.* at Sale, and of zinc, *e.g.* at Ammeberg.

*N.B.*—In both countries great attention is being paid to the vast water-power, which is estimated for Norway alone at 5,000,000 horse-power. It is being used to generate electricity, for the separation of nitrogen, etc, *e.g.* on the Hardanger Fiord.

## Denmark.

1. THE commercial importance of the position commanding all the entrances to the Baltic is enormous.

1. The Great Belt, the only one deep enough for men-of-war, is of course entirely Danish ; but the Danes dare not use the position against Russia or Germany
2. The Sound is very straight, at right angles to the prevailing winds, and broad enough and deep enough for all the merchant shipping of the Baltic ; so that Copenhagen—a free port—commands the whole trade of the Baltic.
3. The fisheries are important, the Skager Rak being specially rich in mackerel and sprats (' anchovies ').

2. Want of coal and water-power has restricted all industries except those connected with farming.

1. There are no minerals of any value except chalk and peat ; but the chalk is exceptionally pure, and is much in demand for various industries, *e.g.* cement, putty, wall-paper.
2. All the main industries are directly connected with the land ; but there are subordinate industries connected with imports from Danish colonies, *e.g.* eider-down from the Faroe Islands, sulphur from Iceland, cryolite and sealskins from Greenland

3. Surface and climate have greatly encouraged pastoral and agricultural industries

1. Except in Bornholm, the surface is so level that agriculture and transport (especially by water) are made as easy as possible, and so low that there are numerous pools and lakes—to compensate for the absence of rivers—in the small islands, which make up one-third of the whole area.
2. Except in the west of Jutland—where wasteful destruction of the old beech-forests has allowed the sea-sand to blow inland, as on the French Landes, and thus to spoil useful farming areas—the porous, sandy soil has been made fertile by careful spade-culture.

3. The insular position guarantees a mild, moist air during the growing season, but, as soon as the Baltic is frozen, the country is exposed to the full 'continental' keenness of the east winds, which are so useful for cleansing and pulverising the soil.
4. The liability to fogs, caused by the warm S.W. winds meeting the cold water of the Baltic, is unfavourable to wheat, but by no means adverse to grass, hardy grains, and hardy roots—all of which supply fodder for the enormous number of horses, milk-cattle, and sheep
5. The geographical conditions and the small size of the farms are alike favourable to dairy and poultry farming, both of which are managed with extraordinary skill and under the strictest rules. Millions of really fresh eggs and tons of the best butter in the world are exported every year. The bacon is almost equally good, and is largely exported to London, the total export to Britain being valued in normal years at nearly £7,000,000 for bacon, and over £10,000,000 for butter.
6. Outside the dairy and poultry area, the land is chiefly devoted to sheep and horses. The latter are bred specially for army-mounts; the former supply raw materials to the woollen and leather industries of Odense and Copenhagen, and the glove industry of Randers
7. The agricultural products are mainly oats (for the horses) and barley (for the Copenhagen breweries and distilleries), and various root-crops which are used in the distilleries as well as for cattle-food in winter. It is a special advantage that these bulky crops can be collected by canal at little ports, *e.g.* Aarhus and Aalborg, and forwarded to Copenhagen over sea, or exported direct to London from Esbjerg.

### “Russian” Lands.

1. Their geographical conditions, like their history, have retarded commercial development

1. All the bordering seas are inland seas ; the most important have narrow entrances which are controlled by foreigners , their ‘fresh’ water, the absence of tides, and the ‘continental’ exposure render them peculiarly susceptible to frost. Indeed, almost every port except Odessa, Sebastopol, Hango, and Windau, is ice-bound for at least two months every year , and Sebastopol, the best of the four, has been in recent years a naval station—where no commerce may be done. Windau, however, is the most free from ice, and, like the Finland port of Hango, is a great exporter of butter.

*N B* —Ice-breakers are beginning to be widely used.

2. The surface and climate have not favoured those industries which tend to concentration of people and consequent progress in civilisation, and have favoured the production in mass of vegetable ‘raw materials’—in itself an obstacle to other industries—and expansion eastward, which has been a further drain on a population already too thin
3. The huge area, and the consequent variety of climate and product, make the country almost self-supporting , the dead level of the surface has impressed its monotony on the people , and the severe frosts completely stop the general river-borne commerce for the months during which domestic locomotion is most easy—because it can be done by sledges over hard and smooth snow instead of over the vile roads

2 Russia proper contains nearly half the area of Europe ; and the greater part of it is a series of low, very level plains—part of the Great European Plain—which slope down almost imperceptibly to the four seas.

1. As there are no mountains in the north, and as the Urals offer practically no obstacle on the east, the whole country is exposed to the icy Arctic and Siberian winds in winter
2. As the country is too far from the Atlantic to get much rain, or to feel the moderating influences of the open ocean and

the Gulf 'Drift,' the climate almost everywhere is very dry and has great extremes

3. Such moisture as is brought by south-west winds off the Mediterranean and the Black Sea, is generally intercepted by the Caucasus range, of which the Yaila Mountains in the Crimea are really a part

*N B*—The greatest drought and the greatest extremes are in the same place—in the lowlands north-west of the Caspian; and the dryness, as in Canada, makes the cold much more bearable

4. Climatically, the scanty rainfall causes the volume of the rivers to greatly decrease in summer, though the amount of forest helps to store and economise the rainfall; and the exposure to the north and the east causes nearly all of them to be ice-bound for at least three months every year. The grain-port of Rbinsk is ice-free for only 219 days.
5. Physically, the lowness of their banks causes them to flood easily when the snow melts; many of them are impeded by rapids—e.g. the Dnieper and the Neva—or by shallows—e.g. the Don, all of them empty into inland seas; most of them flow through thinly-populated districts, some even flowing over the barren Tundias, and the longest of them, the Volga, empties into a landlocked lake (which is drying up), and goods have to be forwarded to the Don *via* Tsaritsin.
6. On the other hand, the very gradual slope makes their current very slow, and enables the whole country to be covered with a network of canals, the enormous size of the country makes their courses generally very long, and their basins very large; they flow in all directions from the common centre of the Valdai Hills; and they supply a large proportion of the fish required on the numerous 'fast-days' of the Greek Church.

3. The surface is divided naturally into five belts of vegetation from north to south.

1. The Tundras are bleak, moss-covered plains stretching east and west of the White Sea—the home of the reindeer.
2. The Forests cover the whole country south of the Tundras down as far as a line drawn from Warsaw to Perm, the chief timber ports being Riga and Kronstad (Petrograd), Libau and Revel. They are composed partly of pine and fir, and partly of deciduous trees, such as oak, beech, and birch; in the clearings of the pine and fir region the soil and climate are so suited to rye and oats that Russia produces two-thirds of the oats and half the rye of Europe, in the clearings of the deciduous trees, especially in the basins

of the Duna, Kiasma, and Kama, the fibre mould of the fallen leaves is peculiarly suited to flax and hemp—producing nearly four-fifths of the world's crop of flax and more hemp than any other country

*NB*—The pine forests are the source of the great, but decreasing, fur export; the oak and beech forests shelter huge herds of swine, and the birch forests supply the bark which gives 'Russia' leather its pleasant scent. Amongst the subsidiary forest products are resin, tar, turpentine, potash, and wood-pulp

3. The Agricultural Belt, from the Pruth to the Volga, owes its importance to its rich 'Black Earth.' When untilled, this soil is covered with the flowers which make Little Russia so famous for honey, when cultivated, even in a primitive way, it produces enormous quantities of wheat and maize. Above the main wheat-belt, much barley is grown, below it, the river-lowlands produce excellent tobacco, especially round Saratov and Kishinev, thousands of acres near the coalfields are devoted to sugar-beet, especially in Poland and Ukraine, and the poor Baltic lands produce large crops of potatoes (used, like the rye, for food).
4. The Pastoral Belt is mainly the Steppes. Much of it is very salt, being part of the old bed of the Caspian (cf. § 2 (5)), and most of it is a waste of snow in winter and a waste of sand in summer, but in spring and autumn it can support an immense number of horses and cattle. The horses are largely cavalry-mounts, but supply hair for export, and the mares' milk is fermented into 'koumiss'. The cattle—which, like most 'continental' cattle, *e.g.* those in U.S.A., are of inferior quality—are kept mainly for hides and tallow, Russia being specially famous for leather, but Russia itself, and Finland, are becoming very important for butter.
5. The Fruit Belt extends across the extreme south of the country, throughout which there is a large area under the vine, mainly in Bessarabia, the Crimea, and Trans-Caucasia. In the latter district also, under the shelter of the Caucasus, all sorts of sub-tropical fruits will ripen in the open air, and even cotton is grown. Cf. p. 42.
4. Both Russia and Poland have great mineral wealth, especially in coal and iron, and Russia also in the precious metals, but it is at present very poorly developed, especially in Russia

1. The Urals are rich in platinum, gold, copper and silver, over 90 per cent. of the world's platinum coming from between Ekaterinburg and Perm.
  2. Perm has also a coalfield and a rock-salt industry, but the chief sources of salt are the Donetz basin, the Crimea, and the great salt-marshes north of Astrakhan.
  - 3 The gold industry—between Oïsk and Petropavlosk—is aided by the presence of mercury, especially near Ekaterinoslav in the Dnieper basin and behind the little Caspian port of Derbent.
5. The coal area is larger than that of any other European country, it is well distributed, and conveniently near iron and limestone
- 1 The chief Russian field is in the Donetz basin, where the coal is largely anthracite, and where the presence of good iron and sheep-pastures has raised a woollen industry, *eg* at Kharkov and Poltava Cf Mariupol and Yuzovka iron-works
  - 2 The next field is in the very heart of the country, round Tula, it has helped to make Moscow the great railway centre of the country, and has drawn to it a large trade in raw cotton and silk *via* the Caspian Sea, in wool from the Dnieper basin, and in flax from the Volga basin
  - 3 There is also a small field in the basin of the Kama, near Perm, which has been of very great value in developing the mineral wealth of the Urals, especially the iron and copper
  - 4 The Polish field is in the basin of the Vistula, near Lodz (cf Dombrovo), where there is also iron, and the nearness to the Silesian sheep-pastures, and the facilities for importing cotton and flax up the Vistula to Warsaw, have made Lodz one of the most important textile centres in Europe. Cf p. 69, § 6 (7)
  - 5 On the Caucasian coast of the Caspian Sea Russia has extremely rich oil wells—round Baku. The quality is inferior to that of the American oil, but it is widely used for locomotives and steamers
  - 6 The iron is mined in Russia chiefly in the Kama, Dnieper, and Donetz basins, *eg* near Krivoi Rog and Ekaterinoslav, where water-carriage and coal are special advantages—in Finland, *eg* between Abo and Helsingfors, where the ore is very fine and cheaply worked (with charcoal)—and in Poland, *eg* between Lodz and Kielce, where zinc and lead are also mined. The most important iron industries are round Tula (cutlery, arms, railway-plant) Lodz (textile

machinery), Ekaterinoslav and Berdiansk (agricultural machinery), and Tiflis and Briansk (ordnance)

7 Fine granite comes from the Piterlaks quarries near Viborg.

6. About  $\frac{2}{3}$  of the population, and  $\frac{1}{10}$  of the industries are on these coal-fields and the Black Earth.

- 1 The Polish coalfield maintains a very important "American" cotton industry. The central coalfield monopolises the silk industry of Russia, and has also the largest woollen industry, between Moscow and Tver, and the largest linen industry, between Moscow and Kostroma. Petrograd has a more important linen industry than the Warsaw district, and a more important woollen industry than the Kharkov district. Tiflis and Erivan are famous for carpets.

*N.B.*—Tammerfors with its 'lake' climate and water-power, manufactures wood-pulp, paper, and cotton. Cf. Narva.

2. The northern agricultural districts support an enormous distilling industry, the rye and potato lands of the Baltic provinces being the great centre, especially in Esthonia; the export naturally gravitates to Revel and Riga.

*N.B.*—Riga is also the chief egg port, having exported in a single year 30,000, out of a total 130,000, *tons* of eggs, mainly from Kazan and Valkov.

3. The agricultural lands of the south-west support a large beet-sugar industry, especially at Kiev and Kharkov, and the pig-farms of the maize-district (Bessarabia) supply bristles.
4. South Russia is famous for flour-milling, the flour going mainly to Odessa, though the grain goes mainly to Kherson, Nikolaiev, Rostov, Taganrog, Meimpol and Berdiansk.
5. Various fishing industries, especially in connection with sturgeon (*eg* caviare and isinglass), thrive on the Caspian and Azov seas—*eg* at Astrakhan and Rostov.
6. The cattle-districts support various 'tallow' industries (*eg* soap and candles) and—when near enough to the forests to have easy access to bark, etc.—various 'hide' industries, especially leather, *eg* at Kazan, Kiev, and Kherson. Cf. the skin and fur fairs of Irbit and Nijni-Novgorod.
7. The Warthe basin of the new Poland is largely a labyrinth of bogs, but the reclaimed lands are very fertile, and have been well cultivated—by Polish labour; and, if the plebiscite gives the rich coal, iron and zinc of Upper Silesia to Poland, she will become a very important factor in the economic development of Eastern Europe.



### Germany.

1. THE central position gives unique advantages for trade with other European nations without 'break of bulk,' but the climate is a drawback

- 1 One-third of the frontier is sea, and, though the shore water is so shallow that large vessels cannot approach the land in most places, there are at intervals all along the coast places where rivers have worn deep channels. Even the shallow water has advantages for various fishing industries, including the amber 'fishing' off the East Prussian coast.
2. Owing to the absence of protection on the north and on the east, the Baltic ports are very much hampered by ice in winter, and even the North Sea ports are not quite free from it. Ice-breakers are used, *e.g.* at Stettin and Lubeck, but are no satisfactory substitute for naturally open water.
3. On the other hand, the two 'free ports' of Hamburg and Bremen have many advantages. Hamburg has a fine outport in Cuxhaven (also a 'free-port'), its communication inland is almost perfect, and it has access to Kiel by the Kaiser Wilhelm ship-canal, which saves the long and dangerous route round the Skaw. Bremen, as the nearest port to the Atlantic, has special advantages for Atlantic trade (*e.g.* cotton and emigrants), it has a good outport in Bremerhaven, and it is guarded by Wilhelmshaven, the only German naval station that is never ice-bound.

*N B* —The port of Emden is naturally the best in Germany

4. In the extreme east and west the dead level greatly facilitates international trade by rail, river, and canal, and, even in the most mountainous parts of the frontier, river valleys give easy access to and from surrounding countries, *e.g.* the valleys of the Doubs, Danube, Rhine, and Elbe
2. The surface is divided into two areas—the north being low and level, and the south being high and hilly.

1. The east and centre of the northern plain are very sandy, and were naturally much less fertile than other parts of the Great European Plain, but they have been immensely improved by assiduous scientific culture.
2. As in France, the watersheds are far enough from the sea for the rivers to be of considerable length, and the general slope of the land carries the rivers out towards the north-west, which causes German goods to reach markets in the same directions as British.
3. The flatness of the country, or the lowness of the watershed, causes the current to be generally slow, and therefore very favourable to navigation. For instance, the Ems is navigable to near Munster, the Weser to near Cassel, the Oder to Ratibor, and the Niemen to Gdodno, and none of them flow from mountains that are much higher than Ben Nevis. The Oder and the Niemen are now, like the Elbe, the Rhine, and the Danube below Ulm, made international waterways.

3 The rivers are, therefore, very important, especially those which empty into the North Sea

1. The Rhine binds together southern and northern Germany; and, in addition to its immense value as a glacier-fed highway of commerce, it has also a very fertile basin. River-steamers can navigate the whole distance up to Bâle, and as far as Bamberg on the Main, and small ocean-steamers can reach Mannheim and Frankfurt.

Bâle—which is thus the head of navigation—commands the end, and Strassburg the centre, of this valley plain. Bâle distributes trade to France, Germany, and Switzerland, the Rhine and Rhone are connected by a canal *viz* Mulhausen; and Strassburg guards the Vosges passes.

From Mannheim—which is thus the head of the ocean traffic—to Mainz it flows over a broad alluvial plain; and the junction with the Neckar, besides bringing timber from the Black Forest, makes Mannheim the head of navigation even for most of the river-steamers.

Between Bingen and Bonn it cuts through a slate plateau, which ends in the Drachenfels. This portion is famous for its vineyards on the sunny slopes of Mount Taunus, and for 'the Confluence' (Coblentz) with the Moselle.

From Bonn northwards it is called the Lower Rhine, and flows through the extremely rich mining district of Rhenish Prussia, which contains cities like Cologne—practically an ocean port—Dusseldorf, Elberfeld, Barmen and Krefeld.

2. The Elbe is three times as long as the Severn, and has good navigation right up to Prague *via* the Moldau. It flows in its middle course through the sheep-pastures, the coal and silver mines, the salt-fields, and the beetroot farms of Saxony—one of the most densely-peopled parts of Europe, and it is the great highway of commerce between the chief port, Hamburg, and the capital, Berlin, *via* the canals of the Havel and Spree rivers.
  3. The Vistula becomes again a Polish, but an international, river, Danzig is made a Free City, with a territory of its own, the Oder flows through the great mining and manufacturing district round Breslau, and through the agricultural district round Frankfurt, and then becomes the highway of commerce between Berlin and Stettin.
  4. The Danube is valuable chiefly because it is connected by the Ludwig canal with the Main and Rhine, which gives it a through trade. It is navigable by steamer from Passau up to Ratisbon, and for boats up to Ulm, and is the link between the (poor) pencil-wood of the Franconian and Black Forests and the (poor) lead of Passau. The best pencil-wood—the so-called ‘cedar’ (juniper)—and the best graphite are imported.
- 4. The climate varies with the surface, but it is dry everywhere except amongst the Baltic marshes, and therefore is subject to extremes.
1. The height of the south counteracts the warmth of the latitude, but the Rhine valley is well enough sheltered to enjoy the full advantage of the warm latitude, and has rich alluvial soil, with winter rain and rather dry summer.
  2. The Harz Mountains, which catch the wet winds coming across the plain of the Netherlands, have the heaviest rainfall. Extremes of temperature increase towards the east, *i.e.* with the distance from the Atlantic, and the whole country slopes generally northward, *i.e.* away from the sun.
- N.B.*—Contrast the south slope of the famous ‘seed’-nurseries of Erfurt.
5. The central coast-lands and the hilly districts, wherever there is sufficient rain, are covered with timber, especially beech, pine, fir, spruce, and birch.
1. The toy factories of Nurnberg, Coburg and Sonnenberg draw wood from the ranges known as the Black Forest, Bohemian Forest, and Thuringian Forest, quantities of timber are floated down the rivers, especially the Niemen and the

Neckar; and the beech and oak forests contain huge herds of swine, the famous Westphalian hams coming from the grain-lands below the Teutoburger Forest

*N B*—Sonnenberg and Furth are specially famous for dolls.

6. Pasture is found almost everywhere—for sheep on the drier hills in the east, and for horses and cattle on the damper plains of the west and north.

1. Saxon and Silesian wools are very fine, and supply some of the raw material used in the factories of Gorlitz, Liegnitz, Chemnitz, and Breslau, but the number of sheep reared is steadily decreasing, owing mainly to the pressure of population in converting pasture into ploughed land, but partly to the greater ease of importing wool
2. The horses and cattle come mainly from northern parts of the Great Plain—the cattle specially from the damper climate of Schleswig-Holstein and Hanover, and the horses specially from the more 'continental' climate of Pomerania and East Prussia. Large numbers of cattle and some sheep are also reared on the 'Alpine' pastures of Swabia and Franconia
3. Besides the wool, the direct pastoral products include especially cheese from Southern Bavaria, Schleswig-Holstein, and the Lower Rhine, and leather from Saxony and Alsace, especially Leipzig and Strassburg.

7. The north, however, being the flattest part of the country, is largely devoted to grain and roots.

- 1 Rye, which needs neither good soil nor good climate, is the most important grain; potatoes are even more important—as food for the peasants—than the black rye-bread, and are grown in enormous quantities, especially on the low sandy soil of Pomerania and West Prussia. Both are used in the numerous distilleries of the north-east
2. The beetroot is grown towards the west end of the plain, especially in Hanover and Brunswick, which supply the sugar factories and distilleries of Magdeburg and Brunswick, and on the Rhine and Oder coalfields

8. The sheltered valleys of the south-west, with their rich alluvial soil and lower latitude, can grow plants such as the vine, hops, and tobacco.

1. The vine flourishes best on the dry, sunny slopes of the Vosges Mountains, though of course only light wines can be produced, and the hops grow very well in the Bavarian valleys, where they supply specially the breweries of Munich, and in Alsace-Lorraine. The soil and climate of the Bavarian tableland are peculiarly well suited to growing barley for brewing; and similar 'barley' land in the north of Brunswick has encouraged the cultivation of hops along the Aller.
2. The richest tobacco plantations are along the Rhine, especially between Freiburg and Kehl (alienated from Germany for fifteen years), and between Karlsruhe and Darmstadt, and very good flax is grown among the forest-lands of the upper Danube.
- 3 Both tobacco and flax are grown elsewhere, *e.g.* tobacco along the Oder between Frankfurt and Stettin, and flax amongst the forest-lands of Westphalia and Saxony.

*N B*—The linseed-oil industry of Danzig depends on raw material from Poland.

9. Germany is rich in coal, and produces also salt, zinc, silver, and copper, but now lacks iron.

1. The coal is generally found near navigable water, in the basins of the Rhine, Elbe, and Oder. This increases the value, and attracts manufactures, but one-third of the output is lignite.

*N B*—By the Sarre coalfield France adds more than 20 per cent to her output, but Germany loses not 5 per cent of hers.

2. In the Rhine basin the coal lies along the Ruhr, where there is also some excellent iron. The chief centre is Dusseldorf, but the best collieries are between Mulheim and Hoerde, especially at Werder, Wattenschied, Witten, and Wetter. Ruhrort, Dortmund, and Duisburg are specially 'shipping' points.
3. In the Elbe basin there is coal in both the province and the kingdom of Saxony. In the former, it is almost entirely of the lignite kind, but quite good enough for use in the sugar-refineries and distilleries of Magdeburg, and in the salt-works of Schönebeck, Stassfurt, and Halle. In the kingdom of Saxony the chief collieries are round Zwickau and Lugau.
- 4 The richest deposits of iron now are in the Harz Mountains, but cheap transport on the Rhine and the Moselle will probably enable Germany still to draw large supplies from Lorraine and Luxemburg—under very different political conditions and economic terms.

5. The chief silver mines are on the Saxon coalfield at Freiberg, the salt is on the neighbouring lignite-field round Halle, the copper is found in the Erz and Harz mountains, *e.g.* at Mansfeld, with silver, the zinc is on the Rhine coalfield at Aachen, and the plebscite about the Oder coalfield may leave to Germany the exceedingly rich zinc and iron field of Königshütte

10. Abundant and well-distributed supplies of coal and metal, good discipline and technical skill, and cheap river and canal transport have led to a great development of manufactures

1. The 'continental' climate is adverse to most textile industries, and artificial suffusion of the mills is both an extra expense and a poor substitute for a naturally humid atmosphere; most attention has therefore been paid to hardware (especially iron) and chemical industries (especially aniline dyes, *e.g.* of Frankfurt and Ludwigshafen) Cf the electric industries of Berlin, Nurnberg, and Frankfurt, and the drugs of Darmstadt, Hanover, and Leipzig
2. The chief 'iron' districts are the Ruhr and the Saxon coal-fields Essen, Iserlohn, and Hagen make all kinds of iron and steel goods, but Essen specialises in cannon, and Iserlohn in needles. Remscheid and Solingen are famous for cutlery Chemnitz and Breslau make machinery, and the great junctions of Berlin and Cologne have railway works.
3. Amongst other non-textile industries are the fine china of Dresden and Meissen (on the Meissen 'clay'), the fine glass of Bavaria, the commoner china and glass of Weimar and other Thuringian towns, the printing and bookbinding of Leipzig (cf its skin and fur market), the printing of Stuttgart, the map-making of Gotha, and the lithographic stone of Solnhofen •
4. The textile industries are confined to the least 'continental' parts of the country, especially the Rhine lowland, and there is considerable division of labour, the best yarns being imported Cotton is becoming the most important, though the least suited to the climate
5. There are two chief cotton centres—Westphalia and Saxony Elberfeld-Barmen and Gladbach, which make all kinds of cotton goods, have the best supplies of coal and iron, Chemnitz and Zwickau specialise, like Nottingham and Leicester, in such 'inland' products as hosiery and lace.

6. The wool industry has two chief centres—the northern, *ie* damper, slopes of the Ardennes and the Sudetes. The Ardennes district now uses almost entirely foreign wool (imported up the Maas), and Aachen (Aix-la-Chapelle) makes all kinds of woollen goods, cf. Elberfeld-Barmen. The Sudetes districts has a fine home product, but must specialise in such ‘inland’ goods as shawls and hosiery, cf. Górlitz.
  7. The linen industry, like the woollen, has two chief centres—Westphalia and Silesia. The former uses local and Belgian flax, especially at Bielefeld, the latter uses Saxon and Polish flax, especially at Hirschberg.
  8. The quality of the water in the Gaer river, and easy access to the Italian raw-silk markets, make silk a speciality from Krefeld to Neuss and at Cologne and Baden. Cf. the old silk industry of Jülich and other towns along the Roer.
11. Some of the larger cities illustrate exceedingly well the laws governing the growth of industrial and commercial centres.
1. Berlin stands on a sluggish stream in the middle of a sandy plain, but politics and commerce have conquered these natural disadvantages. It is the capital of the Duchy of Brandenburg, the kingdom of Prussia, and the German Empire; the plain is very low, giving every facility for communication in every direction, and the city is roughly in the centre, commanding the routes from Hamburg to Breslau, Stettin to Halle, Cologne to Danzig, etc.
  2. Munich has both political and commercial importance; it is the capital of the kingdom of Bavaria, and a railway centre commanding the traffic of North Germany with the Adriatic—up the Inn valley and over the Brenner Pass.
  3. Leipzig was the centre of the old road system of Northern Germany, which has in modern times become a railway system in connection with the Saxony coalfields. Its position made it a university, and this drew to it a very large book and printing trade. In connection with book-binding, it became a great leather market; and it is also one of the greatest fur markets in the world.
  4. Dresden has both political and commercial advantages, it is the capital of the kingdom of Saxony, and stands on a navigable river in the middle of a coalfield, just where it commands the passes through the Erzgebirge into Bohemia.

5. Cologne, like Breslau, has the advantage of a navigable river, and a very rich coal and iron field ; and the latter, and its position between France and Germany, have made it a great railway centre.
  6. Frankfurt (on Main) stands on a navigable river, the valley of which is the natural route from the Danube (at Ratisbon) to the great coalfield of Rhenish Prussia , and the sunny slopes of the hills, which shelter it from the north and north-east, are very favourable to the vine. Its position between the two rivers, and between North and South Germany, made it the old capital of the German Confederation, and makes it now a most important railway centre.
  7. Magdeburg stands in the middle of a coalfield on a navigable river, just where the hardness of the rock makes it easy to bridge the river. There is a great deal of salt in the neighbourhood, and the soil and climate suit sugar-beet.
  8. Hanover, the old capital of the kingdom of Hanover, is on the direct line from Rotterdam to Berlin, in a plain where the soil and climate are very favourable to roots, especially beet and potatoes, which are used in distilling spirits.
  9. Nurnberg commands the southern part of the Main valley, as Frankfurt does the northern ; and it utilises the surrounding forests and the (inferior) graphite of Passau in its famous toy and pencil factories. Cf. Furth
- N B*—It is too far from water-transport to make *heavy* goods
10. Breslau, with the advantages of a navigable river, is a frontier market for manufactures from the west and raw materials from the east between eastern and central Europe , but, if the plebiscite gives the 'Gleiwitz' coal, iron, and zinc field to Poland, Breslau will be brought *very* near the frontier, and will lose a great deal of its economic importance.



### The Middle Danube Lands, including 'Bohemia.'

1. These lands illustrate, as an area, what Breslau illustrates as a spot.

1. They are a frontier 'market' between the manufactures of Western Europe and the raw materials of Eastern Europe
2. They represent a 'mixed zone' between Teuton and Slav, where racial jealousies make government difficult, and constantly disturb trade Cf note on p 83
3. Their prosperity depends on 'inland' communication with manufacturing and agricultural neighbours

2. The mass of the country is surrounded by mountains except where the Danube enters and leaves it

1. The difficulty of governing has been increased by the isolation of Galicia and Bukowina, of Bosnia and Dalmatia, and by the mixture of peoples—*e.g.* Germans in N W, Slavs in N E., Magyars in S E, and Italians in S W
2. The small stretch of coast has no natural harbour except Pola, which has hitherto been only a naval station, but both Trieste and Fiume have been provided with good 'artificial' communication inland, and have been much benefited by the Suez Canal
3. Access by rail to neighbouring lands is facilitated—though not made cheap—by river valleys, especially those of the Elbe, Adige, and Morava; by mountain passes, especially the 'Moravian Gate,' the Semmering Pass, and the Jablunka Pass (cf. the Brenner and the Red Tower Passes); and by such tunnels as the Arlberg.

3. The surface consists mainly of the great plain of the Middle Danube, and both soil and climate also favour agriculture.

1. Except on the Pushtas of northern Hungary, the low alluvial soil is very rich, especially in the Banat, Galicia, and the S.W. river-basins; and the volcanic soil of the plateaus is

also very productive, *e.g.* in Bohemia and Transylvania, though the northward slope of Transylvania minimises the effect of the sunshine in the more southern latitude

2. As the mountains are not high enough to entirely exclude either cold winds from Russia or hot winds from Africa, and as the distance from the sea prevents every part except the Alpine coast from having a large rainfall, the high Austrian plateaus have very cold winters, and the low Hungarian plain is exposed to droughts

*N B*—The dryness is so intense that even large lakes, *e.g.* Platten See (Lake Balaton), are gradually drying up

- 3 The Adriatic provinces still have mild winters and dry summers—which is very favourable for fruit-growing; but the destruction of timber has exposed the soil so much to the action of rain, hot sun, and icy Boia, that the Karst district has become practically a desert

*N B*—The breeding of singing birds, especially canaries, is important round Innsbruck

4. The size of the country and the low level, especially of Hungary and Galicia, make the rivers exceedingly useful for navigation. Besides the great international highway of the Danube, there are many miles of very useful navigation on outward-flowing rivers, such as the Elbe and Vistula, and on 'home' waters, such as the Theiss (to Tokay), the Drave (to near Marburg), and the Save (to Sissek)

4. The vegetable wealth of the country is so great that the empire is essentially 'agricultural'

1. Pasture, forests, and 'agriculture' proper, are all important; but the products which support home industries, are found mainly in the Austrian part, where 'western' civilisation is most advanced, while those which are exported as raw materials, are found mainly in the Hungarian part

5. The most important animals are horses, cattle, sheep, and pigs, but goats and silkworms are reared in the south-west

1. As usual with great military empires, there is a large demand for horses and mules, and huge herds of both are fed on the Pushtas, or 'steppes' (grass-land subject to great extremes of climate), of northern Hungary, especially round Kecskemet. Sturdy little horses and mules are also reared round Serajevo and Mostar.
2. 'Wild' cattle also are most numerous on the Pushtas, especially round Maria-Theresiopol, Kecskemet, and Deb-

reczin; stall-fed cattle come mainly from Galicia; dairy-cattle are kept round the large towns, especially in Austria, and in the Alpine districts, especially the Tyrol

*N.B.*—There is a large leather industry in Vienna, Prague, and most Hungarian towns

- 3 The sheep are most numerous on the dry hills of Bohemia and Silesia, where they supply wool to the factories of Reichenberg, Brunn, and Troppau
- 4 The pigs are most numerous among the oak and beech forests of the south, especially in the maize district of the Save basin, *e.g.* round Agram
5. The goats are confined to the Alpine heights, where they are largely responsible for the glove-industry of Innsbruck and other Tyrolese towns, and the silkworms to the sheltered Adige valley, where the mulberry can get sufficient warmth and moisture, and where the climate is fairly suitable for textile industries

6 Agriculture supports directly two-thirds of the population; but, owing to soil and climate, it is much more important in Hungary than in Austria.

1. As four-fifths of the exports reach the sea by rail, freightage is expensive, and this is increasing the pressure of foreign competition to such an extent that agriculture is in a rather precarious position
2. The people almost everywhere eat rye-bread (from grain grown in the mountain districts or imported from Germany and Russia), very large crops of oats are raised throughout the horse-breeding area of the north; barley is grown on the Bohemian plateau; and immense quantities of wheat and maize are grown on the low plains of Galicia and Hungary, where the dry climate and the good machinery are very favourable to flour-milling, especially at Buda-Pesth. Liability to drought makes the yield uncertain and subject to great fluctuations—grave commercial disadvantages.

*N.B.*—The dry climate, the presence of limestone, and the amount of grain encourage poultry farming. Two *billions* of eggs are exported annually, mainly from S W Bohemia. Cf. the honey of Slavonia, where the dry air favours the presence of essential oils in the flowers for which the soil is so suitable

3. Potatoes are grown all over the region, but especially in Austria, and beetroot (for sugar) is grown on the Bohemian and Moravian coalfields. Both are also used, like the various kinds of grain in Hungary and Galicia, in distilling. And, as the soil and climate of Bohemia are as favourable to hops as to barley, the Elbe basin is famous for beer, *e.g.* at Pilsen. Cf. the Vienna and Brunn beer.

4 Flax, hemp, and tobacco are very important—the flax and hemp along the Russian border (cf p. 67), where they supply the Moravian and Silesian factories, *eg* at Przemyśl, and the tobacco in the warm moist valleys of the south and along the Theiss, especially round Szegedin and Zombor

5, The vine flourishes on the sunny slopes of the Carpathians, especially round Erlau and Tokay, and of the Fruska-gora, especially round Karlovitz, the famous 'prune-brandy' is made from Hungarian prunes, and the warmest parts of the south-west produce almonds, figs, olives, etc

7. The country is very rich in timber, immense quantities being floated down the Danube.

1 Nearly one-third of the whole country is under timber, and in Bosnia, Herzegovina, and Bukovina (Beech-land), the proportion is much greater

2. The wood of the north-west is made into cheap furniture at Vienna and Prague, that of the south-west is exported, from either Trieste or Fiume, to Sicily for orange-boxes or to France for wine casks Paper, 'bentwood' work, and toys are very important

3 The potash of the Bohemian Forest, and the mineral wealth of the Eger Basin, have made Bohemia very famous for ornamental glass. Cf. the glass of Krumau and Karwin

8 The country is well provided with minerals, especially coal and iron, salt, silver, lead, gold, opals, mercury, and oil, but they are not properly developed.

1. Salt is found mainly in Galicia, Transylvania, and Salzburg (= Salt-town) The mines of Galicia, especially at Wieliczka, are the most famous in the world, the bed is 300 miles long, 4000 feet deep, and has been worked for 600 years The Bosnian salt supports chemical industries at Dolnja Tuzla.

*AB* —The oil also comes from Galicia, especially from round Lemberg.

2. The silver—one of the 'colouring' metals which, with the silica and potash, have made Bohemia famous for glass—comes mainly from the Elbe and Eger valleys, *eg* Příbram and Joachimsthal; silver and lead are mined in Transylvania, especially near Klausenburg, and the lead mines of Carinthia are the richest in Europe, especially at Bleiburg.

3. Amongst the other minerals of Bohemia are kaolin and graphite, and such 'colouring' metals as copper and cobalt. The kaolin accounts for the porcelain of Pilsen and Karlsbad, and the graphite for the pencils of Budweis.
  4. The gold is found only in Hungary, mainly round Kremnitz and Schemnitz, and in Transylvania, mainly round Zalatna; and the opals are most abundant near Vorosvagas. The mercury, which is very valuable to the gold industry, comes from Idria.
  5. The coal and iron are found in fair abundance, and are worked both in the north-west and in the south-west, but, unfortunately, they are not found close together. The best coal is in Bohemia, Moravia, and Silesia, especially round Pilsen, but the fields along the Erz-gebirge, where the iron is mainly found, are lignite. Abundance of excellent iron is found in Styria and Carinthia, especially round Graz and Eisenerz; but the coal again is lignite.
9. For various reasons, political and commercial, manufactures hold a subordinate position
1. The chief political reasons are racial quarrels and the heavy taxes; the chief commercial reasons are the expense of transport by rail, the distance of the producing centres from suitable markets, the unsuitability of the climate for textiles, and the fact that coal and iron are not found side by side. Under such circumstances there can be no great concentration of population; only nine towns have as many as 100,000 inhabitants, only five have 200,000.
  2. Vienna lies between the northern and southern provinces of Austria, just where the Danube leaves the Austrian highlands for the Hungarian lowlands; and it, therefore, commands the eastward and westward traffic along the Danube, and the northward and southward traffic through the Semmering Pass and up the Moravian valley, *i.e.* from Trieste to Cracow. The north traffic brings wool, and the south traffic brings silk, for textile industries (*e.g.* carpets), but the typical industries for such a 'continental' centre are in metal (tools, machinery, musical instruments, and railway plant) and in wood ('cabinet' and cheap furniture, musical instruments, and wood-pulp paper).
  3. Buda-Pesth stands at the lowest place where the Danube can be conveniently bridged, the banks being of hard rock, and it has railway communication in every direction over the huge plain of which it is the mathematical centre. Its special industries are in flour, cheap furniture, and leather.

4. Prague is the natural centre of Bohemia ; it has the advantage of the navigable Moldau-Elbe, and of the Bohemian coal and iron-field , and it stands on the old road through the Eger gap from Coburg to Breslau The hops and barley of the Beraun valley, the silver and kaolin of the Eger valley, and the flax and wool of the Elbe valley, make it the central market for Pilsen, Karlsbad, Reichenberg, and Trautenau Budweis manufactures pencils
  5. The textile industries are practically confined to the northern coalfields—the centres being Reichenberg, Trautenau, and Pilsen, Brunn and Mylau, and Troppau Naturally, woolen goods are most important, and silks are better than linens or cottons Silk goods are also made in the mild S W, especially at Innsbruck and Dornbirn
  6. Graz is the great hardware centre, with its neighbouring towns of Hulenberg and Klagenfurt ; but Vienna, Prague, Brunn, and Steyr are also important Gablonz produces enormous quantities of imitation jewellery.
10. The Czecho-Slovak area was the economic base of the Austro-Hungarian empire
- 1 It is the core of Europe, at about equal distances from the chief inland seas, with easy access by the Saxon, Moravian, Magyar, and Austrian "gates," and the natural link between Danube and Elbe, Oder, and Vistula
  - 2 With a good climate and industrious people agriculture has been well-developed , potatoes, as a staple food, are more important than grain (mainly rye and oats), and there is a large output of beet sugar The best hops in the world are grown round Saaz
  - 3 The mineral wealth is still more important especially in the valleys of the Beraun and Eger (cf Karlsbad and Radnitz) and of the March and Oder (cf Brunn and Ostrau), and the wealth of fuel, backed by abundant water-power, especially on the Sudatic ranges, has made the area one of the most important industrial areas in Europe

## Switzerland

1. SWITZERLAND is now the only country in Europe which has no sea-coast, and the mass of the country is surrounded by very formidable natural ramparts—the Alps and the Jura.

- 1 This position makes the country entirely dependent on other countries for foreign commerce, and therefore always on the side of peace; it also causes considerable variety of language—many persons speaking French, German, and Italian—which is a great commercial advantage
- 2 The great passes—especially the great St Bernard, the St. Gothard (tunnelled for about  $9\frac{1}{4}$  miles), and the Simplon ( $12\frac{1}{2}$  miles, but easier gradients), and the Splügen, Maloggia, and Arlberg (tunnelled for  $6\frac{1}{2}$  miles)—and the great lakes which form part of the boundary, give access to markets in all the surrounding countries in spite of the natural isolation of the country, and an international Rhine should greatly help the foreign trade, and especially the import of coal.
- 3 Like all inland districts, it specialises in articles which demand much labour but little raw material, *e.g.* watches, and the excellence of the products, *e.g.* the St Gall 'prints,' makes them able to bear the expensive transport by rail.

2 The vegetation varies with the climate and soil; but the height makes the general temperature low, and a quarter of the surface is useless

- 1 The Alps are too high to admit the warm winds from the Mediterranean, but they cause a very heavy fall of rain and snow, and most of the snow is melted by the Föhn wind.
- 2 The deep sheltered valleys in the south are often very hot in summer; while the northern plateau is much exposed to cold winds in winter.
- 3 The melting snows, as usual, carry down to the low levels an immense amount of alluvium, which is very fertile; but elsewhere the soil is poor, though the southward slopes of the mountains are very sunny.

3. Under such circumstances, the higher and more exposed parts are devoted to forests and pasture, while the lower and more sheltered parts are devoted to agriculture.

1. The timber is grown mainly in the basins of the Rhine and the Rhone, and supports a large wood-carving industry, especially in the tourist-haunted district between Interlaken and the Jungfrau

*N.B.*—Fruit-trees (apples, pears, and cherries) abound in sheltered places

2. Large numbers of cattle, goats, and sheep are fed on the Alpine pastures up to a height twice as great as that of Snowdon, especially in Grisons, but, of course, in winter they have to be taken down to the valleys, which have just yielded the hay-crop for winter food. Very large quantities of condensed milk and cheese are exported, the latter mainly from Gruyère *via* Lake Geneva.

*N.B.*—Butter-making suffers from the high prices obtained for cheese.

3. The agricultural products are few—utterly insufficient for the food of the people, but grapes are grown successfully along the sunny southern slopes of the Jura and all along the north shore of Lake Geneva, and fibres are grown in nearly every part of the country—flax and hemp on the low tableland of the north, and tobacco in the warm valleys of the south, especially in the Ticino basin. The latter district also grows the mulberry, and supplies some of the raw silk used in Zurich and Bâle

4. There is practically no mineral wealth, and the want of coal ought to be very serious; but the water-power is so universal, so constant, and so strong, that manufactures are very important

1. The poverty of the soil has aided in this result, which has been further assisted by the excellent education of the people. The latter is exceedingly important, as it enables the universal water-power to be used in the cottages of the workers, and so avoids most of the disadvantages of industrial centres
2. The manufactures are mainly such as need much skilled labour but little raw material, *e.g.* watches, wood-carving, embroidery, morocco leather (goats). Cf Birmingham.
3. The railways have, of course, immensely increased the ease of importing raw materials, *e.g.* cotton and silk.



4. Zurich is the largest town, with a population of 200,000; but, owing to the condition under which the people live and work, many of the towns are important in spite of their small population. Zurich owes its importance mainly to its commerce as a railway centre—for Geneva, Constance, Schaffhausen, the St Gothard Tunnel, Bâle, and the Aarberg Tunnel. It manufactures silks, like Bâle, fine cottons, like St. Gall and Glarus; machinery, like Winterthur and Geneva, and is the capital of German Switzerland.

*NB*—This north-eastern corner of the country is especially famous for its electrical and hydraulic machinery and its machine embroidery.

5. Geneva is the capital of French Switzerland, it commands the large trade with France, and has abundant water-power. Its chief industry is watch and clock making, which is also carried on in Neuchâtel and neighbouring towns, especially Le Locle (chronometers) and La Chaux-de-Fonds.

*NB*—If the proposed Rhine-Rhone waterway *via* the Aar, the lakes of Biel and Neuchâtel, and the old Enteroche canal, is carried through, it will greatly increase the importance of Geneva.

6. Bâle commands the trade with the Rhine valley, it is a very important railway junction on navigable water, and it specialises in silks. The central position of Bern is very suitable for a political capital, it commands the only coal in the country (between Bern and Fribourg), and it has a special industry in scientific instruments.

*NB*—A waterway with at least 6 feet of water for 300 days in the year could easily be created from Bâle to London.

7. Amongst the other industries, the most important are straw-plait, especially in the upper basins of the Ticino and the Inn and the lower basin of the Aar,—chemical dyes, in the upper basin of the Simme and at Bâle,—aluminium, at Rheinfelden,—and leather, at Geneva.

### Italy.

1. BOTH by position and by 'relief' the country is fitted for a great commercial and industrial centre.

1. As it has sea on three sides, and stands in the centre of the most important inland sea in the world, with the Atlantic and the Indian Ocean equally accessible, it has exceptional advantages for commerce
2. By land it is part of the shortest route from the busiest industrial centres of Europe to the Suez Canal; and the Alps, which seem to isolate the country, are crossed by four or five lines of railway and six or seven really good roads, and are the source of the inexhaustible water-power which makes Lombardy naturally an industrial centre.
3. The variety of climate and the fertility of the soil make the land able to support a denser population than any other equal area of Europe. This is specially true of the north,, where the water-power is strongest and most constant.

2. The general climate is much benefited by the maritime position of the country and by the protection of the Alps; but, of course, the continental part is drier and has greater extremes than the peninsular and the insular parts.

1. The south, however, suffers from the dry sirocco from Africa, while the dryness of the north is more than compensated by the abundance of water from the Alpine glaciers.
2. The direction of the Apennines enables them to intercept all the dampest winds, and the absence of islands towards the S W, the wet quarter, causes a rainfall of 50 inches on the Ligurian Alps behind Genoa, which encourages textile industries in Genoa and Alessandria
3. In the meantime—i.e. as long as the drainage is neglected—the lowlands to the west of the Apennines, especially the Maremma, Campagna, and Pontine marshes, are a source of malaria; but for the same reason they would be very fertile if properly drained.

3. The surface is naturally divided into three areas—continental, peninsular, and insular.

1. The country is, like Egypt, too long to be easily governed from a single centre; and the different character of the surface gives the different areas different interests and habits, as well as different products
2. The continental area, or plain of 'Lombardy,' is composed of very rich alluvial soil, and sheltered on every side. So much mud still comes down from the Alps that the river beds are sometimes raised above the level of the surrounding country, and have to be banked in, and the delta of the Po is every year advancing farther into the Adriatic, which accounts for its suitability for growing rice. The Po is navigable for nearly 300 miles, and its Ticino and Adda tributaries are navigable up to the lakes; Piacenza and Cremona command points where the Po is easily bridged, and Ferrara commands the delta waters. The Adige is navigable up into the Tyrol.
3. The peninsular area consists practically of the Apennines, with strips of lowland in some places between the base of the range and the sea. As the range is nearer to the east coast than to the west, the longest rivers flow to the west, and the largest areas of lowland are along the west coast. The Arno is navigable to Florence, and the Tiber to Rome; and the Tiber valley gives access from Rome to Rimini and the independent republic of San Marino.
4. Between the islands there are productive sardine and tunny fisheries, and coral and sponge industries, the gulfs of Tarento, Policastro, and Oristano being special centres for the tunny fishing.
4. The vegetation is generally luxuriant, owing to the cloudless sunshine and the abundant water; but there are some drier parts, which make useful pasture.
  1. Sheep feed on the dry hills of Apulia, Abruzzi, Tuscany, and Piedmont—the last supplying the wool factories of Turin, and the first two supplying the catgut industries of Naples. Next to poultry, mutton is the favourite meat-food of the people. Cf. the woollen industry of Prato.
  2. Cattle feed on the moist lowlands of Lombardy and along the western coast, the former supplying the 'Gorgonzola' and 'Parmesan' cheese of Milan, and the latter fattening lean cattle imported from abroad, e.g. round Grosseto.

3. Pigs roam through the chestnut forests of Umbria and Sicily; the peninsula is famous for donkeys and mules; and the Alpine area supplies goat-skins for 'morocco.'
  5. The agriculture includes grain, fibre, and fruit.
    1. The two former require, as a rule, flatter land than the fruit; but all of them depend on irrigation, and the chief value of the Italian rivers is for irrigation, which is made exceptionally easy by the raising of their beds by alluvium
    2. Wheat is raised in the drier part of Lombardy, in Sicily, and in Apulia, which produces excellent wheat for macaroni and other alimentary pastes, the straw is largely used for making hats, especially at Leghorn and in other Tuscan towns.
    3. The splendid irrigation of Venetia and Emilia produces crops of maize and even of rice. The maize makes the 'polenta' food of the people, and the dry climate and abundant grain, combined with railway facilities through the Alps, have led to a huge export of eggs. Cf p. 80
    4. Flax and hemp are grown on the irrigated plain, the flax round Cremona and the hemp round Bologna, and cotton and tobacco are grown in the extreme south, along the coast of Calabria and Sicily.
    5. Millions of silkworms are reared on the endless rows of mulberry trees in Lombardy (most) and Piedmont (best), and supply the silk market of Bergamo and the silk industry of Milan Cf the Neapolitan silk.
    6. The vine flourishes on the dry sunny slopes of the Apennines and in Sicily, especially round Florence ('Chianti'), Alessandria ('Asti'), Parma ('Felino'), and Marsala.
- NB* —Italy produces more silk than any other country in Europe, and more wine than any other except France
7. The olive grows almost everywhere south of Florence, unless the elevation is too great; but the best oil comes from Lucca. The southern olive districts are also famous for figs and almonds, *e.g.* round Gallipoli and Otranto.
  8. Oranges and lemons come from Sicily, Sardinia, and Calabria —the best oranges from Catania, and the best lemons from Messina. Very good citrons come from the same areas.
  9. There are large chestnut forests along the upper Tiber and in Sicily, and plantations are common in all parts, as the chestnut is a staple food of the peasants.

6. The great defect of Italy is the absence of coal, which has retarded manufactures and increased the reckless use of wood.

1. The scarcity of fuel is somewhat compensated by the abundance of water-power. Already quite a large number of textile industries have been started at the base of the Alps and the Apennines, *e.g.* at Biella (woollens) and Lucca; and, as the use of water-power spreads, there will probably be a great development, especially in the silk trade.
2. Most of the timber which has been cut down so recklessly, has been used by the railways and the dockyards; and the destruction of the timber has materially affected the climate, for woods moderate extremes of temperature, increase the rainfall, and fertilise the soil—by their leaves, by checking quick radiation of heat, and by preventing the top soil from being washed away by sudden rain.

7. The most important minerals are sulphur, marble, iron, salt, borax, and silica.

1. The sulphur is most abundant in Sicily, being found round Catania, Caltanissetta, Licola, and Girgenti—the product of the very rich Girgenti deposits being shipped from Porto Empedocle. It is wonderfully free from arsenic.
2. Italy produces the best marble and the best marble-cutters in the world, the chief quarries being at Carrara, Massa, and Brescia.
3. The iron of Elba and Sardinia is of excellent quality, and ore of a less valuable kind is also found in the north of Lombardy. The port of Elba is called Ferrajo, the 'iron-mongery'; Milan is still famous for cutlery, and used to be famous for 'Brescian' swords.

4. Salt is produced round the coast, especially in the Gulf of Caghari and in the Emilian marshes. Cf. the Trapani salt.

*N.B.*—Cagliari also exports lead, iron, copper, and zinc, mainly from the Iglesias district.

5. Boracic acid is produced in Tuscany, especially near Leghorn, and in the island of Volcano. In the former it rises as a vapour from certain volcanic rocks, and in the latter it is found incrusting the crater of a 'volcano.'
6. The silica of Murano was the origin of the great Venetian glass industry. (Cf. the salt of the Piave marshes.)

8. The great industries are agriculture and commerce, but manufactures are becoming more important.

1. The chief textile manufactures are in the north, especially at Milan and Turin. Both cities have abundance of water-power, Milan commands the centre of the great plain and the St. Gothard and Simplon tunnels, as Turin commands the head of the plain and the M. Cenis tunnel, the Lombard mulberry-groves encourage Milan to specialise in silk, as the Piedmont sheepwalks encourage Turin to specialise in woollens. Other rising centres are Pinerolo, Novara, and Varillo. There are great facilities for bleaching.
2. The damp climate and the ease of importing raw cotton make Genoa and Chiavari famous even for cotton industries, the large hemp field of Venetia and the Po delta support cordage industries, especially near Treviso, Cremona, and Mantua, Bologna, Ravenna and other towns in Emilia manufacture the local flax; olive 'waste' supports soap industries at Florence, Genoa, Bari, and Reggio, Parma and Piacenza specialise in such 'wheat' products as alimentary pastes, and Leghorn and Pisa in such as straw-plait.

*N.B.*—Piacenza is also a rising 'cotton' town. Cf. Sarno and Salerno.

3. Local deposits of various 'porcelain earths' support 'majolica' and other china industries at Florence, Faenza, and Naples, Florence, Venice, and Rome specialise in mosaics; the nearness to the iron ore of Elba, and the ease of importing coal, make metal industries important in Liguria—Sestri and Spezia specialising in shipbuilding, Savona and Voltri in machinery, and Genoa in shipbuilding, machinery, steel rails and locomotives.

9. Most of the harbours are great commercial centres.

1. Genoa owes its supremacy to its excellent harbour, its facilities for communication inland *via* the Bochetta Pass and the St. Gothard Tunnel, its position as the centre of the seaboard railway from Marseilles to Rome, and the opening of the Suez Canal (1870) and the M. Cenis tunnel (1871). It is the natural outlet for Lombardy, and—through Lombardy—for much Swiss and German trade.
2. Naples has a magnificent bay under the shelter of Vesuvius, where the fine climate and volcanic soil produce quantities of fruit (cf. Salerno). The local sulphur and the Apennine sheep (cf. § 4 (1)) have given it an industry in violin strings, and—like Leghorn and Brindisi—it is famous for its coral jewelry. It is becoming a very important industrial centre.

3. Messina commands all the trade through and across the Straits—the old ‘Scylla and Charybdis’; Palermo has a good harbour and a large wine trade; Leghorn is the—artificial—port of Florence and Pisa, Piombino is an ‘iron’ port.
4. Venice has lost almost all its old importance; but it is the natural outlet for the eastern half of the plain of Lombardy, and commands the traffic up the Adige valley
5. Of the smaller harbours, Civita Vecchia is the port of Rome; Spezia, a great naval station, Brindisi, the terminus of the Overland Route to the east, and Ancona, the best harbour after Venice in the Adriatic, with a special industry in asphalt. Chioggia is the great fishing port.

10 Except for Naples the balance of power is moving inland

1. As a fine port, on the edge of a fertile plain, with a large, poor, clever population, Naples has every opportunity of developing within the ‘Free Zone’ recently given to it.
2. The Alpine tunnels, and the character of the goods exported, *e.g.* silk and wine, draw the exports northwards by ‘all-rail’ routes (expensive, but involving no break of bulk), to the relative detriment of the ports
3. The jealousies of the old City States (cf. the number of separate Universities in the north) have been largely removed by the spread of commerce and by Conscription, with its necessary discipline and unifying tendencies.

## Spain and Portugal.

1 THE 'PENINSULA' has a magnificent position for commerce, but its advantages are neutralised by the character of the coast and the shore waters.

1. The coast is very badly supplied with harbours for three reasons —the ocean currents have silted up most of the openings in the N and N W,—elsewhere there are naturally very few openings,—and the majority of the few which do exist, have exceedingly bad communication inland
2. On all sides except the east there are very dangerous currents (cf the wrecks of H M S *Serpent*, the *Roumania*, *Trinacria*, *Utopia*, etc); and along the Atlantic coast there are also very strong tides and the additional danger of a submerged coast-line, which forms a series of sand-banks
3. In spite of these drawbacks, as the formidable double range of the Pyrenees has no good passes over it and no tunnels at all through it, commerce *must* be done mainly by sea.
4. Lisbon, on the magnificent estuary of the Tagus, is well protected from the Atlantic by Cape da Roca. It has good communication by rail and river up the Tagus valley; it has great advantages for an Atlantic trade of its own, especially with the Portuguese islands, *e.g.* Madeira and the Azores, and it is an important calling place between Southampton and Cape Town
5. Barcelona has an excellent harbour on the tideless Mediterranean, but it is strategically cut off from Lisbon by the enormously important British possession of Gibraltar, though protected by the Balearic port of Mahon.
6. There are, however, useful smaller ports on each coast. The Douro is navigable to Oporto for small vessels, but has a dangerous bar, the Guadalquivir is dredged to admit small vessels to Seville; and Cadiz is a fine roadstead. On the north there are the coal and iron ports of San Sebastian, Bilbao, Santander, and Gijon, and the naval station of Ferrol, guarding Coruña. Vigo is a great sardine port.

*N B* —The output of Leixoes avoids the Douro bar.

2 The country is a very compact, lofty, treeless, table-land, isolated by the great buttresses of the Pyrenees



and the Nevada, and crossed by parallel ridges of Sierra.

1. The compactness causes the central parts to be a considerable distance from water, and the tableland comes so near to the sea in many places that communication inland from the coast is extremely difficult.
2. Communication across the Sierras from valley to valley is very difficult, and there are innumerable caves, which shelter robbers and smugglers Cf also the smuggling through the little independent State of Andorra.
3. In the Douro basin there is the plateau of Old Castile round Valladolid, and in the Tagus basin that of New Castile round Madrid In the Ebro basin there is the low plain of Aragon, and in the Guadalquivir basin that of Andalusia
4. The main water-parting is nearer to the Mediterranean than to the Atlantic, and therefore all the long rivers, except the Ebro, empty into the latter The Tagus is the longest and most important; but the Douro and the Guadiana are more than twice, and the Ebro is nearly twice, as long as the Thames All of them are navigable for some miles, and small boats can reach Cordova and Logroño, but, as a rule, they are much too fast and too shallow for navigation, and too much sunk below the general level to be of much use even for irrigation or for their valleys to be easily crossed by railways.

3 The climate is one of the driest in Europe, in spite of the presence of sea on every side; and it has been made still drier by a foolish destruction of the forests.

1. In Portugal and along the north coast there is a heavy rainfall from the Atlantic; but the edges of the plateau are so high, so abrupt, and so near the sea, that nearly all the moisture is condensed out of the winds before they ever reach the interior of the country.
2. The nearness to the Sahara and the narrowness of the Mediterranean expose the southern half of the country to intense heat, though the height of the plateau causes the winter temperature to be low
3. The extremes are very great. For instance, skating is quite common at Madrid; bananas, sugar-cane, and even the date-palm ripen in the Guadalquivir basin.

*N.B.*—Fortunately the south winds have to cross the Sierra Nevada, or 'Snow Range,' which is more than three times as high as Snowdon.

4. The pastoral resources are more famous than valuable, but the country does still produce good sheep, cattle, and horses.

1. The merino sheep thrive on the stimulating herbage of the Toledo Mountains ; but most of the flocks elsewhere are of inferior breed
2. The wild cattle of the Guadarrama valleys supply victims for the bull-fights, and a good many cattle are reared in the damp N W.
3. Andalusian mares are very valuable , pigs are numerous in the Portuguese oak and chestnut forests, and mules everywhere.

*N.B.*—The most valuable forests in Portugal are of cork, which flourishes also in Andalusia and Catalonia. The latter supplies, from Gerona, the best corks in the world for champagne bottles

5. The combination in most districts of great heat with small rainfall makes irrigation of very great importance to agriculture.

1. The unirrigated basin of the upper Guadiana is a desert ; while the famous huertas, or 'gardens,' have made the irrigated portions of Murcia, Valencia, and Granada very fertile and thickly populated

*N.B.*—In the 'huertas' belt the rock has to be blasted, and powdered with hammers, to form soil

2. The agricultural products include all sorts of grain, fibre, and fruit , but the characteristic products are—the vine, the drought-loving esparto grass (especially in S E ), onions, garlic, and chick-peas (the daily food of the people)
3. The vine is the most important crop both in Spain and in Portugal. In the Douro valley, where the vines are roasted for two months in summer, they produce port wine, and Tarragona 'port' is produced in the same latitude on the east side of the country. The more marine climate of Xeres produces sherry, which is exported in very large quantities from Cadiz. Immense quantities of wine are also exported to France from Malaga, Alicante, and Valencia, for 'blending' purposes. Cf the export of raisins
4. The fruits—which are very important, especially in the huertas—are grown along the Mediterranean coast, in Andalusia, and in the Balearic Islands, *e.g.* Seville oranges, •

Majorca lemons, Barcelona nuts, Elche dates ; and the same areas grow liquorice and saffron, *e.g.* between Valencia and Murcia

5. The chief fibre is tobacco, which is grown in Andalusia and Murcia, Seville and Alcoy being the centres. The same area is also very famous for olives and mulberries, the olive being very important because of the amount of oil used. The best 'dressed' olives come from Seville, but the best oil from Cordova.
6. All sorts of grain are grown—from rye to rice. The rice is grown only in the hottest and wettest parts of the south, where also large quantities of maize are grown ; the wheat is grown on the dry plateau of Valladolid, and the rye in the damp and cool N W

6. The varied age and character of the Iberian Mountains make the mineral wealth great and varied ; but the product is mainly exported, not used at home.

1. Coal and iron, the latter of excellent quality, are found in the north. The coalfields are in Asturias, especially round Oviedo, and Gijón is the port. The iron is round Bilbao, Santander, and San Sebastian (cf. Murcian and Almerian iron)
2. Copper and lead are very abundant. The richest copper-mines are at Rio Tinto and Tharsis, and the product is exported from Huelva. The chief lead-mines are also in Andalusia, at Linares, and between Adra and Cartagena.
3. The other minerals are mercury, salt, tin, zinc, and clay. Almaden was at one time the most important mercury centre in the world, and has given its name to the valuable mines of mercury in California, the best salt in the world comes from Setubal, and the product of Cardena and other Catalan towns is not much inferior, tin and zinc are mined in Galicia, New Castile and Majorca, have porcelain-clay (cf. 'majolica').

7 The industries are almost entirely limited to the production of raw materials, mineral and agricultural.

1. Wine-making is much the most important industry, especially at Oporto, Xeres, Malaga, Benicarlo, and Alicante ; flour is milled at Valladolid, Zamora, and neighbouring towns ; oil is pressed round Cordova, Lisbon, and Valencia ; cork-cutting is important round Gerona, Portalegre, Beja, and Cadiz ; and tobacco is manufactured at Seville and Alcoy.

- 2 Textile industries are naturally confined to areas where the atmosphere is most humid, and coal and iron or raw materials are accessible. Barcelona, which combines most of these advantages, manufactures cotton and linen goods, Valencia and Seville, in the chief mulberry districts, manufacture silk; and there are small wool industries in Salamanca and Ciudad Real.
- 3 The sardine fisheries off the coasts of Galicia, Algarve, and Catalonia are very important, and Coruña has an important tinning industry, and the local supplies of tin are so great, and the Asturias lobster fishery is so productive, that probably a similar industry will spring up between Ferrol and Aviles. The value of the annual output of sardines averages about £600,000.
- 4 The iron of the north is manufactured at Bilbao, where there is a flourishing shipbuilding industry; there are gun and cutlery works at Toledo, various 'earths' support glass and china industries near Madrid, *eg* La Grange; and Burgos is famous for sulphate of soda.

*N.B.*—The presence of coal and the Cantabrian water-power are great advantages in the north, *eg* to Bilbao, Oviedo, La Trubia, Lugo, but Cartagena, Almeria, Malaga, Seville have 'virgin' supplies to draw on.

- 5 Want of coal, constitutional lethargy, racial variety, high taxes, and miserable transport, combine to account for the backward condition of manufactures.

### Balkan Peninsula.

1. THE position makes the country a natural channel for commerce between Asia and Europe, and the typical features of coast and surface emphasise this.

1. The coast-line, except along the Black Sea, is so broken that it offers exceptional facilities for commerce. Greece has a larger proportion of coast to surface than any other country in the world, being almost cut in two by the Gulfs of Corinth and Argina, and this helps to make its climate very even.
2. The Danube is an excellent political frontier, being fairly deep, broad, and rapid, its southern bank is hard and high enough to be a good site for towns and fortresses, and the northern is low and marshy. The lower reaches of the river are under the protection of a Committee of Neutrality; the upper reaches give access by water (*via* the Ludwig Canal) to the Rhine.
3. The plain of the Lower Danube separates the Transylvanian Alps from the Balkans; that of the Maritza separates the Balkans from the Rhodope Mountains, that of the Salambria—*i.e.* the Vale of Tempe—separates Mount Pindus from Mount Olympus. And, though the only navigable rivers are the Danube and the Maritza, the river valleys are very useful for communication, especially those of the Vardar, the Morava, and the Maritza, in connection with the Overland Route to Constantinople and Salonica *via* Belgrade and Nish.

2. The division of the surface into a series of mountain-crowned tablelands, separated by deep river valleys, has important political and commercial results.

1. The height of the country, the general slope eastwards, and the absence of protection against the cold NE winds, cause the extremes of climate to be very considerable. For instance, in winter Constantinople is normally 10° colder than Naples; and the Danube is ice-bound in January and February, and its basin is covered with snow, in spite of

the latitude. In the sheltered places, on the contrary—*e.g.* on the south side of the Balkans, and in the river valleys which look southward on to the Ægean—the climate is very warm and even, being purely 'Mediterranean' in the south and the west. Cf. the abundance of honey.

- 2 The configuration of the land divides it naturally into a number of states—all of which are now independent, and the diversity of race, creed, and interests has caused so much political trouble that there has been no chance of proper social or commercial development.
- 3 The absence of coal, water-power, proper communications, and capital has been a further check on any possible commercial or industrial progress.
3. The soil is very poor on the dry exposed uplands, but very fertile in the sheltered river-valleys.
  1. Amongst the mountains in the north and centre there are large forests, especially in Servia and along the Transylvanian Alps; and, as most of the trees are oak and beech, enormous herds of swine are reared.
  2. The dry slopes of the Albanian, Bulgarian, and Rumanian hills are famous for sheep and goats; 'Turkey' carpets are made of the wool, and 'Morocco' leather is made of the goat-skins. *e.g.* at Sliven and Adrianople.
  3. Roses are grown, over an area as large as Berkshire, along the southern slope of the Balkans. The chief centres are Kusanlık and Sliven, between which is the famous Shipka or 'Wild Rose' Pass. Cf. the honey of Shumla.
  4. Plums are a special product of the Morava basin; and the export of maize—the staple food—from the same basin (*via* Galatz) and from the plain of Wallachia is larger than that of any other country in the world except the United States. Maize is also grown on the site of Lake Topolias.
  5. Currants are a special product along the Gulf of Corinth, and in Zante, Cephalonia, and Corfu, Patras is the export centre, and the supply is in excess of the demand.
  6. The mulberry is widely grown in the Morea, Negropont, Rumelia, and the valley of the Isker, and tobacco in the basin of the Vardar, where cotton can be grown, round Arta and Larissa, and behind Kavalla. Negropont (Eubœa) is also famous for wine, and the Vardar basin for opium, especially at Uskub and Bitolia (Monastir).

- 7 Wheat is raised specially in Bulgaria between the Balkans and the Danube, and is exported from Varna, but some is raised on the plain of Thessaly, and exported from Volo. The Rhodope coastland exports tobacco, and Greece exports olives, figs, and valonia, and the Greek islands export oranges and lemons.

4 There is an abundance of mineral wealth, but it is scarcely touched except in Greece.

- 1 The Greeks work lead at Laurium, iron in Seriphos, marble in Paros, emery in Naxos, sulphur in Milos, and petroleum in Zante. Cf the bitumen of Yanina.
- 2 Salt is made at Burgas and other places along the coast, and coal has been *found* near the important harbour and railway terminus of Saloniki.

5. The future of Thrace is of immense importance to Europe, as involving the Adrianople 'gate' and the great land-and-water junction of Constantinople.

- 1 Constantinople occupies one of the most important positions in the world—on the narrow Bosphorus, with the splendid natural harbour of the Golden Horn. It commands the trade between Europe and Asia, and between the Black Sea and the Mediterranean. Gallipoli, which commands the Dardanelles, is a natural naval station.
- 2 Adrianople, at the confluence of the Maritza and the Tunga, with mulberry groves and rose gardens, and near the Rhodope pastures, manufactures scent, silk, and carpets. It is the junction for the port of Dede Agach.

*NB*—South-western Thrace, like South-eastern Macedonia, grows fine tobacco. Cf Xanthi and Kavalla.

6. Rumania consists now of two river plains and the Transylvanian plateau.

1. The plains produce enormous quantities of maize; and the maize and the huge forests along the base of the Carpathians account for the large number of pigs reared. The Carpathian slopes are rich in petroleum, especially near Prahova, and in salt; and the Aluta valley gives easy communication between Wallachia, and Hermanstadt, Klausenberg, and other Transylvanian towns.

2. Bucharest, the political capital, owes its importance to its position in the very middle of the Wallachian plain ; and Galatz is the great grain port of the Danube.
3. Sulina, Braila, and Kusteny are important little harbours, the latter exporting cattle from the plateau ('Dobruja') which causes the sudden northward bend of the Danube. Sulina is on the only channel—much improved lately—suitable for the largest vessels that can navigate the Danube

7. Bulgaria is a typical 'Buffer State,' consisting of the two slopes of the Balkan Mountains

1. Varna is the seaport and railway terminus of the poor northern 'Russian' slope, and Burgas of the extremely fertile southern 'Turkish' slope, and the former gets the Danube trade from Rustchuk by rail
2. Sofia, the capital, perched up amongst the mountains of the interior, just between the Mantza and Morava valleys, commands the railway from Belgrade to Constantinople, *via* Philippopolis

8. Greece is essentially a maritime and fruit-raising country, though naturally rich in minerals.

1. The coast is at least twice as long, in proportion to the size of the country, as that of Great Britain, the surface is covered with masses of mountains, most of which run out into the sea as bold peninsulas, and the sea round is comparatively so small that the climate is sufficiently continental, *i.e.* the air is dry, and the sky is generally cloudless—ideal conditions for fruit.
2. The sea surroundings developed a race of sailors and colonists, for it is easiest to conduct even the *domestic* trade by sea ; and the winding bays and wooded islands afforded every chance to those whom the trade tempted into piracy. Moreover, the belt of mountains along the north so isolated the people that they naturally expanded into Asia—by the bridge of islands across the *Ægean*.
3. The valleys are so near to one another that intercourse could not be avoided, which encouraged commerce, and they are so numerous that the rivalry between valley and valley was very strong.



- 4 Athens practically monopolises most of the industries of Greece, especially soap-making (from olive 'waste'), and it has a typical trade in honey from Mount Hymettus
  - 5 The importance of Patras, the currant port, has been increased by the opening of the ship-canal across the isthmus of Corinth. Hermopolis is a free port on the island of Syra, and its characteristic trade is in sponges
  - 6 Salonika is the terminus of the shortest railway route from London to Egypt, *via* the Vardar valley and the important junction of Uskub (Skoplie), and therefore may supplant Brindisi eventually as a mail station. Some cotton is grown round Salonika, and cotton yarn is spun in the town. It is essentially a Jewish centre
- 9 Albania, though a wild area physically, grows a quantity of grain, and rears many sheep and cattle
1. The people speak a language older than classical Greek, and seem to be incapable of being assimilated by any other racial type
  2. Durazzo is an important harbour, commanding much the best route inland—the old Roman *Via Egnatia*
- 10 The Yugo-Slavian region is a mass of forest-clad mountains, flanked by the Dalmatian Karst on the west and the Morava valley in the east.
1. The magnificent 'Montenegrin' harbour of Cattaro has very difficult communication inland, the natural route being by the 'Albanian gate,' *i.e.* the valley of the lower Drin, and the proposed railway from the port of Medua will greatly help the trade of the Prizren and Novibazar basins
  2. The forests of beech and oak and the maize fields cause the great industry to be the rearing of pigs, and the plum-orchards produce excellent prunes, and support the (plum) 'brandy' industry, especially in Bosnia. Cf. the Maraschino made at Zara from the Dalmatian cherries
  3. Belgrade, at the confluence of two navigable rivers and commanding the Morava valley, is much the most important centre, politically and economically, Nish is a very important junction on the Orient-Express Route

## NORTH AMERICA.

1. NORTH AMERICA has more coast in proportion to its size than any other continent except Europe.

1. For instance, it is not half the size of Asia, but it has two-thirds as much coast, though, of course, in both cases the north coast is more or less useless because of the cold. Even the interior of the continent, at all events towards the east, is within easy reach of the commercial—if not of the climatic—advantages of the sea. For instance, wheat can be shipped direct to Liverpool from Duluth, which is a fresh-water port—like Chicago—*2000 miles from the ocean*.
2. The west coast is much steeper and much less indented, and has much deeper shore-water, than the east coast. It is also the warmer, as the cold Labrador current runs between the Gulf Stream and the east coast.
3. There are numerous harbours, especially in the east, some of which are very large and very safe, and this makes transport of goods easy and cheap. From Labrador to the mouth of the Chesapeake, and from Alaska to the mouth of the Columbia, the supply of good harbours is quite extraordinary.
4. On the Pacific coast south of the Columbia River, harbours are very few and—with the exception of San Francisco—very poor; but that part of the coast is backed—except in California—by a region of very little commercial value, where good harbours would be practically wasted.
5. The harbours on the Atlantic coast south of the Chesapeake were not naturally very good, but they have been immensely improved by dredging and building, and the extreme fertility of the region has amply repaid the outlay.
6. The fringe of islands along the Atlantic is practically a line of sand-dunes caused by the ocean waves breaking in

shallow water, and in the lagoons thus formed there is navigation for small boats almost the whole way from the mouth of the Hudson to that of the Rio Grande. The islands off the northern half of the Pacific coast are mainly characteristic of the fiord system, as in Norway, they keep the inshore water very calm, and are famous for salmon.

- 7 Off Newfoundland there are magnificent fishing grounds where the melting of icebergs, brought down by the cold Labrador current into the Gulf Stream, precipitates over a submarine plateau the soil that all icebergs carry with them from the land on which they were built up.

2. The importance of the large inland seas can scarcely be exaggerated.

1. The Caribbean Sea is closely shut in by the curved ridge on which the West Indies stand, and the barrier of the islands made the sea a natural marine fortress for the Spaniards, from which they were ejected only with great difficulty. The best passages through the barrier are the Mona, between Haiti and Puerto Rico, and the Windward, between Haiti and Cuba. Jamaica commands the latter, and is being greatly benefited by the Panama canal.
2. The main importance of the Gulf of Mexico is that it is the reservoir for the warm water which is driven westward across the Tropics by the Trade winds, to issue from the reservoir as the 'Gulf' Stream. It contains a large area of shallow water, partly due to the encroachment of coral on both sides of the entrance to the gulf, but navigation is safe and easy except during the 'Nortes' gales in winter.
3. The north end of the Hudson Strait is completely ice-bound for more than half the year, but steamers specially built for the ice could keep up continuous traffic with Hudson Bay for at least four months in the year, including fully one month after harvest. The surrounding country is so low and level that it affords great facilities for railway construction inland to Lake Winnipeg, and the rivers, especially the Churchill and the Nelson, might be canalised.

*N.B.*—The bay has a very beneficial effect on the climate to the south of it, especially as it reaches to within 300 miles of Lake Superior.

- 4 The Great Lakes have a total area nearly half the size of the Mediterranean, and are all connected with one another by the St. Lawrence system and ship-canals. Lake Superior alone is about the size of Ireland, and Lake Huron and Lake Michigan are not very much less, Lake Ontario

is about the size of Wales, and Lake Erie is half as large again. The trade on them is enormous, but they are subject to dense fogs and terrible snowstorms.

The difference between the level of Lake Superior and that of Lake Erie is only 30 feet, and there is no difference between the level of Lake Huron and that of Lake Michigan, but there is a difference of over 300 feet between Lake Erie and Lake Ontario, half of which is accounted for by Niagara. There is a complete series of canals on the Canadian side, the Welland going round Niagara; the only canal on the U.S.A. side is the Sault (pronounced *Soo*) St. Mary, which joins Lake Huron to Lake Superior. The Georgian Bay canal will greatly shorten the route.

5. These great inland seas supply rain to the centre of the continent, but the winds do not blow regularly inland, and, when the cold heavy air of winter sinks down over the Great Central Plain, the warm light air cannot penetrate inland with its burden of rain. Along the shore even of the Great Lakes, however, there is sufficient moisture to encourage a dense growth of timber, which supplies the material for hundreds of trucks and millions of flour-barrels used in the huge grain trade of the prairies.
3. The mass of North America consists of a huge plain shut in by highlands on the east and the west.
  1. The most important feature of the western highlands is the range of the Rocky Mountains, which have a very gradual slope inland; and the most important feature of the eastern highlands is the range of the Appalachian Mountains, which also have a more gradual slope inland.
  2. The fact that both systems run north and south causes them to form a very marked barrier to any Trade or Anti-Trade winds blowing inland off the Atlantic or the Pacific; and the fact that both systems have a very gradual slope inland and a much steeper slope seaward, causes the rivers of the Great Central Plain to be much longer and more useful for navigation than the rivers of the coast regions.
  3. The Great Central Plain is divided into two parts by a ridge which runs across it from east to west in the latitude of Lake Superior, and from which the plain slopes down northward to the Arctic Ocean and Hudson Bay, and southward to the Gulf of Mexico. At the highest point the ridge is not higher than Dartmoor or the Pentland Hills, and therefore presents little or no barrier to the passage of

winds northward or southward ; but it is the watershed of the Mississippi, the St Lawrence, and the Red River. Cf. the low Russian water-parting

4 The Great Central Plain consists mainly of 'plain' and 'prairie,' but it merges in the barren tundras of the extreme north and in the Mississippi swamps of the extreme south

1. The prairies are practically the area enclosed and watered by the Saskatchewan, the Red River, the upper Mississippi, and the Missouri, *i.e.* roughly, from Edmonton and Winnipeg to St Louis and Chicago. The plains lie between the prairies and the Rocky Mountains and are higher, drier, and less fertile than the prairies

*N.B.* —Prairies are huge natural meadows on which the rainfall is too small, the glacier-ground soil too fine, and fires are too frequent, for forest growth, though trees grow well on them when protected from fire. The 'Plains' owe their name to their boundless views, *not* to their precise surface-form

5. Between the Appalachian Mountains and the Atlantic there is a strip of low plain which is very important, as it contains all the diverse interests represented by such cities as Boston, New York, and Philadelphia.

1. It is about 900 miles long from north to south, and—except for the break marked by Long Island—is on the average about 200 miles wide. The steepness of the Appalachians on the Atlantic side, the low level of the plain itself, and the heavy rainfall off the Gulf Stream, cause large areas of it to be very marshy
2. The chief cities stand either along the inner edge of the plain, *e.g.* Augusta, Raleigh, Columbia—where water-power is developed by the rivers falling on to the plain, or along the outer edge, *e.g.* Norfolk, Wilmington, Charleston—where bays and estuaries offer sites for harbours. A few cities, on tidal rivers, combine the advantages of both situations, *e.g.* Philadelphia, Baltimore, Richmond

6. There are two important mountain systems in North America—the Cordilleran and the Appalachian.

1. The Cordilleran system runs from Alaska to the Isthmus of Panama, where—after a break of about 100 miles—it is resumed in the Andes. It consists of several parallel ranges, separated by a plateau with an average elevation of one mile above the sea-level, *i.e.* higher than Ben Nevis.

- 2 The Rocky Mountains proper separate the Great Central Plain from the Great Western Plateau, thus forming the main water-parting of the continent. The Wapta and Crow's Nest Passes, used by the *Canadian Pacific Railway*, and the Yellowhead Pass, used by the *Grand Trunk Pacific*, are much the easiest routes across the Rockies. In U.S.A. the *Northern Pacific* crosses them (by the Mullen Tunnel) about 260 feet higher, and the *Union Pacific* (by the Evans Pass) nearly 3000 feet higher, than even the Wapta.
3. The coast ranges are continuous except for the gaps by which the great plateau rivers—the Fraser, Columbia, Sacramento, San Joaquin, and Colorado—reach the sea. And the great height and direction of these ranges cause them to present a very complete barrier to west winds off the Pacific, which would otherwise carry their precious burden of rain far inland. Thus, the 'Great Basin' is partially a desert, and, as all surplus water has to be got rid of by evaporation, what is left behind becomes very saline (usually nitrate of soda), as in the Great Salt Lake.
7. The Rocky Mountains form the great water-parting of the continent, but the Appalachians also have an important, though much smaller, river system.

1. As both these watersheds are outside the Tropics, they depend for their regular supplies of rain and snow on S.W. Anti-Trade winds, but, owing to the great difference in height and in distance from the sea, the snow will melt 5 or 6 months sooner on the Appalachians than on the Rockies.
2. The rivers which flow westward from the Rockies are true 'plateau' rivers, flowing through deep cañons and being of very great length compared with their volume. The rivers of the Great Central Plain, on the other hand, have their beds sometimes raised by alluvium even above the level of the surrounding country; and they drain, water, and provide transport for, a huge area of plain. But the marvellous extension of railways, especially in U.S.A., is partially killing river traffic all over the continent.
3. Owing to the huge extent of plain, many of the rivers are navigable for extraordinary distances. For instance, the Yukon is navigable for 1850 out of a total length of 2000 miles, the Mackenzie for 2000 out of 2500, the St. Lawrence for 2000 out of 2100, and the Missouri for 2600 out of 2900. Except in the extreme N.W., all of them drain more or less directly towards the European markets; and the two main

waterways of the St. Lawrence and the Mississippi have their head-waters within a few miles of each other, while their mouths are 3000 miles apart.

4. The rivers of the Atlantic Plain, like those of the Central Plain, flow through very low and level country, and are very useful, but, like those of the Pacific slope, they are comparatively short, and vary little in volume. They all cross the Old Appalachian belt at or near its low and narrow central part, and the broken character of the system there has given great facilities for railway construction inland from the Atlantic coast, especially from New York. But the most important of them, *e.g.* the Hudson, Connecticut, Delaware, and Susquehanna, run practically north and south, not east and west, *z.e.* not directly inland; and, as this north and south drainage is rather against the general slope of the country, the rivers are often either too rapid for easy navigation, or broken by cataracts like that at Troy. This mainly accounts for the large amount of water-power in New England.
5. The Mississippi has the most important basin in the whole world that is entirely in temperate latitudes. Unlike the Hwangho and the Yang-tse-kiang, it drains from north to south, not from west to east; and this gives it a much greater variety of climate, with the accompanying variation of products. It has a similar advantage over the Amazon, and also has a much healthier climate and large accessible supplies of coal and iron.

Like the Volga, the Mississippi itself rises at a very low elevation, and therefore its pace is not great, in spite of the Missouri and other mountain-born tributaries, the average fall from its very source on the Height of Land to the Gulf of Mexico is not more than 6 inches per mile, and south of the Falls of St. Anthony it is much less. As the river-system is entirely destitute of lakes, however, an enormous amount of alluvium is brought down to the mouth, and this raises the bed of the river above the level of the surrounding country, so that the banks have to be protected by artificial 'levées'.

6. The Missouri can be navigated right up to the foot of the Rockies, the head of navigation above Fort Benton being about 4000 miles from the Gulf of Mexico. But so much of the original volume is lost by evaporation and owing to the porous character of the soil that the Missouri contributes very little more than the Mississippi does to the joint river at St. Louis.

7. The Ohio is in some ways the most important part of the Mississippi basin. It has much the heaviest rainfall—sometimes, in the absence of lakes, causing disastrous floods—and the richest mineral wealth. It is navigable—except for the Louisville rapids, which are avoided by a canal—for its entire length, *i.e.* up to the confluence of the Alleghany and the Monongahela. The Alleghany, again, is navigable from Pittsburg almost up to its source, and is connected by canal with Lake Erie on the St. Lawrence basin.
8. The Hudson is not nearly even half as long as the Ohio, and is frozen in winter, but it is a very important international route. It is navigable for about 150 miles—up to Albany—and its valley has given very great facilities for railway construction, especially *via* its Mohawk tributary. It connects New York *via* the Erie lake and canal with the grain and pasture areas of the Great Central Plain, and *via* the Champlain lake and canal system with the harbour of Montreal, and it supplies New York with a rich annual harvest of magnificent ice. Cf. Wenham Lake.
9. The St. Lawrence rises, like the Mississippi, at a very low elevation, and its average fall per mile for 2000 miles—deducting the 300 feet of the Niagara Falls and rapids—is practically imperceptible. But the coldness of the Labrador current, the presence of so much land round the estuary, the absence of mountains to keep off the Arctic winds, the freshness of the water, and the high latitude, all combine to make it ice-bound for four months every year.

Even when it is open, the navigation is not very good: two of the entrances to the estuary, the Gut of Canso and Belle Isle Strait, are very narrow, the meeting of the Gulf Stream with the Labrador current causes dense and frequent fogs, and the need for ship canals is obvious. But the river comes through so many lakes that its waters are too pure to deposit any bar or delta, and the importance of these lakes for commerce is literally enormous. Ocean vessels can ply for 1000 miles up the waterway—to Montreal, and lake vessels can ply for another 1000 miles—to Duluth.

*N.B.*—Montreal is 300 miles nearer than New York to Liverpool.

8. Extreme contrasts between the seasons and between the coastlands and the interior are the main features of the climate.

1. The difference between the longest and the shortest day in the year is practically imperceptible in the extreme south,



while it is more than twelve hours in the extreme north; and where there is the greatest difference in the length of the day, there are also usually the greatest extremes of summer and winter climate. The difference between the summer and the winter temperature is nearly  $60^{\circ}$  at Montreal, but only  $10^{\circ}$  at Havana

2. Owing to the absence of mountains across the country from east to west, there is no barrier between the Arctic cold and the Tropical heat; and this makes the summers very warm even within the Arctic circle, while the winters are very cold even as far south as the latitude of Algiers. For instance, wine can be made in Canada from grapes ripened on the spot in the open air, while orange-trees are sometimes killed by frost in Florida.
3. This absence of mountains also helps to cause the terrible 'blizzards' of the U.S.A., and to make the navigation on the Great Lakes very dangerous—owing to the strong contrast between the warm water of the Mexican Gulf and the icy water of the lakes. The air over the latter under a cloudless sky is naturally very moist, and thus warm dusty winds from the south coming into this cool moist air cause dense fogs, while cold dry winds from the north cause terrible snow-storms
4. As the mountains run north and south parallel to the coast, they cut off nearly all the moisture which the Atlantic and the Pacific would otherwise send to the interior. Thus, the forested slopes of British Columbia have a really oceanic climate; the climate of the treeless prairies of Manitoba is entirely continental. This also accounts both for the practical absence of glaciers in the Rocky Mountains proper of the U.S.A., and for the healthiness of the climate in spite of the great extremes.

*N.B.*—The Gulf of Mexico is very warm, and the winds carry warmth and moisture from it up the Mississippi valley and along the Atlantic plain.

5. The Rocky Mountains shelter very greatly all the region to the west of them from the cold Arctic winds, though they also bar the passage inland of the warm Pacific winds. Indeed, some of the hottest regions on the face of the earth are between the parallel ranges of the Great Western Plateau, e.g. the Death Valley and the Painted Desert.
9. The relation of land and sea is exceedingly important on both sides of the continent.
  1. The average rainfall along the west coast from about San Francisco up to Alaska, and along the east coast from about

Galveston up to Labrador, is always over 40 inches ; in the interior of the continent it is always under 20 inches, and sometimes under 10

2. The precise amount depends on the character of the winds and of the mountains or other condensing medium. For instance, at Vancouver, which is just in the centre of the Anti-Trade region, the rainfall is about 60 inches, at Winnipeg, which is in the same latitude about 1100 miles inland, it is 16. The result is that British Columbia is covered with dense timber, while Manitoba is treeless. Cf. § 8 (4) above.
3. As there are no mountains in the north-east to precipitate moisture in the form of rain, it is precipitated by the cold Arctic winds in the form of snow, and the snowfall increases with the moisture. At Winnipeg it is about 50 inches, while in the triangle shut in by the Great Lakes, the Hudson Bay, and the Gulf of St. Lawrence, it rises to 160.

*N.B.*—10 inches of snow = 1 inch of rain.

4. The N.E. Trades deposit over 80 inches of rain every year along the Atlantic coast of Honduras and Nicaragua, but, of course, there are no regular winds blowing to the 'tropical' part of the Pacific slope. The S.W. Anti-Trades deposit over 60 inches along the Pacific coast of Oregon and Washington, where the mountains are so near the sea that they meet the wet winds at their wettest; but, of course, there are no regular winds blowing to the 'temperate' part of the Atlantic coast.
5. Owing to the barrier of the Sierra Nevada, there is less than 10 inches a year in the Great Basin, and for similar reasons there is less than 20 inches over the prairie.
6. This absence of moisture inland makes the climate very healthy, but causes great extremes. It is also very advantageous for flour-milling, but disadvantageous for spinning. The cotton-spinners of Lowell have to charge their mills with vapour artificially in order to compete with those of Manchester, but the millers of Minneapolis can compete even with those of Buda-Pesth. Cf. p. 44.
7. The wet side of the mountains produces timber, while the dry side produces pasture; the dry heat of the interior produces wheat, while the damp heat of the coast produces cotton. Cf. the timber of British Columbia and Oregon, the pasture of Alberta and Wyoming, the wheat of Manitoba and Minnesota, and the cotton of Georgia and Carolina. Cf. p. 44.

10. The vegetation may be roughly classified under five regional heads.

1. The Arctic region extends over almost a quarter of the continent; but it consists of 'tundras,' and therefore produces only dwarf vegetation. The summer is hot enough, partly owing to the low level, but it is too short to develop properly the grains and roots which civilised man and his domestic animals need. The length of the winter and the intensity of the cold cause the animals to grow additional fur; and fur is, therefore, at present the main commercial product of the region. But the recent development of gold-mining along the Yukon has proved the existence of considerable mineral wealth in the north-west.

2. The Cordilleran Plateau—which extends over nearly one-fifth of the continent—is also at present practically a desert; but the cause is drought, not cold. Its mountain barriers cut it off from both the climatic and the commercial advantages of the sea, and its dryness and its height combined give it terrible extremes of climate, but the very same causes give it pure air, constant sunshine, and convenient markets among the neighbouring mining centres of the Rockies.

The places where the rapid evaporation has caused the soil to be encrusted with salt, may be regarded as utterly useless; but in most places the soil is deep, and has produced so little vegetation of any kind that it has much fertility stored in it—waiting for water; and the irrigation could be provided for a considerable area by storing the rain that does fall in winter on the mountains, instead of allowing it to run to waste in the thirsty soil during the time that plants are not growing.

3. The Central Plain includes all the 'plains' and 'prairies,' *i.e.* from the Michigan peninsula to the Rockies, and from the southern limit of the Tundras to the northern limit of the Gulf lowlands.

The 'plains' are a huge tract of rolling grass-lands, stretching parallel to the Rockies from Alberta to Texas; and on them the air is clear and bracing, the ground is firm and dry, the water-supply is sufficient, the grass is rich, and land is very cheap. In fact, they form ideal pastures—for sheep on the higher, and for cattle on the lower levels.

The 'prairies' lie to the east of the plains, and are lower, warmer, and richer. They are practically a continuous stretch of low and level land, far enough from the sea to be dry, but with enough vegetable matter in the soil to retain

moisture; they have been enriched for centuries with the ashes of prairie fires and the bones and other refuse of beasts and birds, until their fertility is extraordinary; they have been in cultivation for very few years, especially in Canada; and they have remarkable facilities for transport.

4. The vegetation of the Tropical coasts and the West Indies is very varied and very prolific, both the heat and the rainfall being great, but it is less important than that of the 'Temperate' Coast Region

11. This 'Temperate' Coast Region is so important that it needs to be treated with more detail.

1. The Atlantic section of it may be roughly divided into three distinct areas—a forest area, from Chesapeake Bay up to the Laurentian Mountains (cf the name *Penn-sylvania*), a fibre area, from Chesapeake Bay round to the Rio Grande; and, intruding into the fibre area, the fruit area of Florida.
2. The snow is the main cause of the forest, it also makes excellent temporary roads through the forest in winter, and when it melts in spring, it carries the 'logs' down to the saw-mills. The trees include both evergreens such as pine and spruce, and deciduous trees such as birch and maple; and the chief 'lumber' States at present are Quebec, Maine, and New Brunswick. Cf the maple-sugar of Vermont.

*N.B.*—The northern limit of forest, and the southern limit of 'Barren Lands, are determined simply by the length and the warmth of the summer

Both New England and Lower Canada owe much of their subsequent prosperity to the 'lumberers' who cleared the land, made roads, and built bridges for the farmers who were destined to follow them. The cleared land was devoted to 'mixed' farming. The soil is not very fertile, having been deposited by glacial action, but for that very reason it does not wear out easily under constant tillage; and the climate, being more even than farther inland, allows a greater variety of crops. For instance, the lowlands of Ontario produce cheese, while those of New York produce hops; the peninsula of Nova Scotia produces apples, while the Delaware peninsula produces peaches.

3. The fibre area commands the markets of the world for the best cotton and the best 'pipe' and 'cigarette' tobacco.

The tobacco is grown on the higher and more northerly parts, *i.e.* the south-east corner of the Alleghany Mountains, the chief states being Kentucky and Virginia. This area was never covered with glacier; and, though the Kentucky

limestone is still very fertile, the Virginian soil is growing so perceptibly poorer that Richmond has quite lost its pre-eminence in the tobacco trade—in favour of Louisville.

The cotton is grown on the lower and more southerly part, from South Carolina to Texas, but is of two kinds—'sea-island' or long-staple, and 'upland' or short-staple. The long-staple cotton is grown on the low islands off Georgia, South Carolina, and Florida, where the warm damp air is so favourable to the plant that its product is the finest in the world, and is used for all the best French and Swiss muslins. The short-staple cotton is much the more abundant, growing over all the low land in the south of the Mississippi basin; but it is much the less valuable.

*N.B.*—Florida is a sandy swamp enjoying such advantages in latitude and from the Gulf Stream that it is an ideal place for semi-tropical fruit, *e.g.* pine-apples and oranges.

4. The Pacific section of this temperate coast may also be roughly divided into three areas

From California northwards there is an area of timber and fruit, the pears being specially famous. Forests cover all the west, *i.e.* the wet, side of the Cascade Mountains; and the range of temperature is so little that some of the trees, *e.g.* the Douglas fir, grow to an enormous height—300 feet.

In the centre there is a grain and fruit area. Between the Sierra Nevada and the Coast Range there is a valley about 400 miles long and from 60 to 70 miles wide. The northern half of it is splendidly watered by the Sacramento, and the southern half by the San Joaquin; and the dry heat is particularly favourable to the production of wheat, wine, and wool. The sheep naturally occupy the highest, and the wheat occupies the lowest land; and the vineyards cover the gentle slopes between the two.

*N.B.*—There is a 'fan of detritus' at the mouth of nearly all the Californian valleys which greatly facilitates irrigation.

In the south there is a practically useless strip—from S. Diego southward. It comes within the area of the N.E. Trade winds, and therefore has no regular winds bringing rain to it. The heat of the tableland itself, however, is so great that it is the cause of a south-east monsoon, which brings the only considerable supplies of rain to the Pacific coast of Central America.

- 12 North America is very rich in minerals, especially in coal and iron and in the 'precious metals,'

mining industries succeeding agriculture where the new undisturbed strata of the prairie give place to the old disturbed rock of the mountains.

1. The country is naturally divided into three great mineral fields, corresponding to the three great mountain systems. The Appalachian field, which stretches from the Gulf of St. Lawrence to Alabama, is specially rich in coal and iron; the Cordilleran field, which stretches from the Yukon to Mexico, is specially rich in gold and silver; and the Laurentian field, which is thoroughly explored as yet only round Lake Superior, is specially rich in iron and copper.
2. The coal is mainly confined to the United States and Canada, but in both countries it is found near to iron, to limestone, and to navigable water. This greatly increases its value, and lowers its price.

The States produced 650,000,000 tons in 1918, though their coal area is only three times as large as the Canadian. The Canadian fields are rich, well distributed, and conveniently situated, but the beds have been so much disturbed by mountain-building in past ages that they are very difficult to work. Except in the anthracite districts, the U.S.A. seams are more or less uniformly horizontal, above water level, and very thick, the huge U.S.A. output is due mainly to the large proportion (60 per cent.) cut by machinery and the high output *per cap.* (nearly 800 tons in 1918) of the miners actually engaged.

3. The iron is found in each of the three great mineral fields. The richest Laurentian deposits are in Michigan, where there is neither coal nor limestone, but this is more than compensated by the facilities for transport on the Great Lakes, *e.g.* at Marquette, Escanaba, and Menominee. The Appalachian field extends more or less from Nova Scotia to Alabama, but the most useful deposits are along the Ohio in West Virginia and along Northumberland Strait in Nova Scotia. The Cordilleran deposits are most worked on and round Vancouver Island, where fuel and transport are very cheap.

*N.B.*—The U.S.A. output of iron-ore is one-third of the whole world output (*c.* 150,000,000 tons), France now coming second with over one fifth.

4. Oil and gas are found mainly in the United States, though both are found in Canada. The U.S.A. oil comes mainly from the western Mississippi basin (Texas, Oklahoma, and Illinois), though California is the most important single State, and it is carried by pipes down to the Gulf and the Atlantic. The Canadian oil comes mainly from the north

shore of Lake Erie, *z.e.* the south-west of Ontario, especially from Petrohia. The gas is found mainly in Pennsylvania, especially round Pittsburg, and is extremely useful in the iron and glass industries

*N.B.*—Russia, the second great producer in the world, raises  $\frac{1}{3}$ , and U.S.A. raises  $\frac{2}{3}$  (nearly 600,000,000 barrels in 1918).

- 5 North America produces, mainly from the Cordilleran system, more gold than any other continent except Africa, and more silver than all the other continents together

The gold is found mainly in Colorado, California, Alaska and Nevada. Small quantities are also mined in British Columbia and along the Yukon. The U.S.A. mines are hampered by want of wood and of water, but have the better climate and the advantage of quicksilver near at hand, the Canadian centres are very difficult of access.

The silver is found in very large quantities across the U.S.A. plateau from Nevada to Montana and Colorado, and in still larger quantities on the Mexican plateau. There are also very rich deposits in the West Kootenay District of British Columbia and the Cobalt District of Ontario.

The United States produce more gold than any other country except the Transvaal, and more quicksilver than any other country, Spain coming second. The Californian mines take their name of New Almaden from the old Spanish mines at Almaden.

6. Copper is found both in the Cordilleran and in the Laurentian systems, and the output is greater than that of any other continent, Europe coming second. The Cordilleran deposits are richest in Montana and Arizona, *z.e.* the east and west slopes of the Rockies; the Laurentian are richest in Michigan and Ontario, *z.e.* the south and north shores of Lake Superior.

*N.B.*—The United States produce  $\frac{3}{4}$  of the copper of the world.

7. The United States also produce more lead than any other country in the world, though Spain held the pre-eminence till quite recently. The output comes mainly from Colorado, though several other Cordilleran States contribute largely.

*N.B.*—The amount and variety of minerals in the United States are accounted for by the size of the country and by the very varied age and character of the mountains. Cf. Spain.

13. North America has not furnished any really valuable animal for the use of civilised man, but all the most useful animals have been domesticated in the country with complete success.

1. The most important fauna of the continent may be classified under three heads —The fur-bearing animals of the frozen north, the food fish of the east and west coast, the sheep and cattle of the Great Central Plain.
2. The fur-bearing animals may be subdivided into —(a) Seals from the Pribilof Islands and other parts of the Alaskan coast, (b) Big game, such as bear and elk, which are comparatively valueless, (c) The various small animals, such as marten, sable, silver fox, beaver, mink, skunk, which come mainly from the rough and otherwise valueless marshes to the east of the Mackenzie. This area also supplies eider-down, ptarmigan, etc.

*N.B.* —St Paul is much the largest fur-market in America.

3. The fish may also be subdivided under three special heads :—(a) Sea fish, especially cod and herring, from the great Atlantic 'banks,' the cod coming mainly from the Newfoundland, and the herring from the New England banks; (b) Salmon, especially from the cold, clear rivers of Washington and British Columbia, Astoria and New Westminster being the great centres, (c) Oysters, mainly from Chesapeake Bay, where the Susquehanna and the Potomac provide the necessary percentage of fresh water and alluvial mud, and where the Delaware peninsula protects the beds from the violence of the Atlantic.

*N.B.* —The cold Labrador Current brings down millions of minute crustaceans, etc., on which the herring live, and the cod, in turn, live largely on the herring.

4. The sheep and cattle are found, literally in millions, on the eastward foot plains of the Rockies from Alberta to Guatemala. The sheep come mainly from the higher or more mountainous parts, *e.g.* Montana and New Mexico. The cattle are relatively most important in Guatemala, but enormously most numerous in the United States, though their numbers have decreased seriously in recent years, and most of the Mexican cattle are sent into the States.

*N.B.* —Over almost the whole region the climate is magnificent, the grass rich, the water-supply sufficient, the price of land small, and transport convenient and very cheap.



### Canada.

1. THE surroundings and surface of Canada are peculiarly favourable for raising and exporting large quantities of raw materials.

1. The physical conditions which make the north frontier now comparatively useless, were the original cause of the fur-trade, which was the beginning of Canadian prosperity; and the absence of a physical barrier between Canada and the States is very beneficial to commerce, especially by rail.
2. Magnificent harbours on the two most important oceans in the world give every facility for sea-trade
3. The size and simplicity of the surface features favour the production of staples on an enormous scale, and make the country able to provide itself with all necessities except typically tropical products, and the same surface features give exceptional advantages for internal traffic by land and water

2. The Atlantic coast is most important at present.

1. It has been the longest settled, it has unique facilities for communication inland, it looks towards the European markets, and its fisheries have great political importance; but it has grave climatic disadvantages, the worst being that all the river harbours, and all the Gulf harbours except Paspebiac, are ice-bound for 4 or 5 months every year.
2. Halifax has almost all the essentials of a successful harbour. It is large and deep, with excellent anchorage and its entrance protected by M'Nab Island; it is easily accessible from the ocean by the largest vessels afloat, in any weather and at any state of the tide; it has direct communication inland, being the terminus of the Inter-Colonial Railway; it is within easy reach—by water—of the Sydney and Pictou coalfields; the richness of the land and the denseness of the population behind it guarantee return cargoes without much delay or difficulty; no charge is made for dockage, and there are great facilities for repairing vessels.
3. St John is much farther from coal, and is an inferior harbour, being specially troubled by the tide. The funnel

shape of the Bay of Fundy, its smooth volcanic floor, and the pressure of the Gulf Stream, cause the tide to rise higher and faster than anywhere else in the world.

4. Port Nelson—the port of the Hudson Bay Company's fur-station at Fort York—lacks almost every climatic and commercial advantage except nearness to Europe, but this makes it the objective of the line from Le Pas.
5. Montreal is much the most important of the river harbours, but it is handicapped by the climate. It is on an island, at the head of navigation for large ocean steamers, and it is the eastern terminus of the St. Lawrence canal system, the southern terminus of the Ottawa canal system, and the northern terminus of the Champlain canal system. It stands at a point at which the St. Lawrence is most easily bridged, it is the terminus of the *Inter-Colonial Railway*, and the junction between it and the *Canadian Pacific* and the *Grand Trunk* Railways. It is the natural outlet for Ontario, the most populous and important of all the provinces; it exports enormous quantities of grain, flour, cattle, and cheese, from or through Ontario, and timber from the Ottawa; but it has no coal.

*N B.*—Its winter traffic is done through Halifax or Portland (Me.).

6. Quebec is much more important than the little island harbour of Charlottetown (P. E. I.), but it has entirely lost its old pre-eminence, mainly owing to the deepening of the river up to Montreal. It is the centre of a large lumber and pasture district, and the combination of pasture with forests of hemlock spruce has given rise to one of the largest leather industries in North America. As the nearest port to the Atlantic (for the less settled parts of the country), it controls the immigrant traffic, and is now connected by bridge with Levis (for the *Inter-Colonial Railway*).
7. An enormous amount of trade is done across the Great Lakes—especially *via* Toronto, Hamilton, and Kingston, which are within easy reach of the Pennsylvanian coal, and do a general trade. Fort William and Owen Sound are specifically 'grain' ports.

*N B.*—The first large lock on the 'Soo Canal' was opened in 1881, and by 1891 the tonnage had risen from 2,000,000 to 9,000,000, it is now about three times that of the Suez Canal. The proposed Georgian Bay Canal will further increase this huge traffic.

3. The Pacific Coast is really the best, and is becoming exceedingly important.

- 1 It is never ice-bound, and has a prodigious wealth of magnificent fiord harbours, and, with the development of its own minerals and the manufactures of Japan, it will become a most important commercial centre
- 2 Of the mainland ports, Vancouver is better than New Westminster, Burrard Inlet being a larger, deeper, and safer harbour than the mouth of the Fraser, and Vancouver has, therefore, been made the terminus of the C.P.R. But Prince Rupert, the terminus of the *Grand Trunk Pacific*, is better than Vancouver.
- 3 The island harbour of Esquimalt, the port of Victoria, is one of the great natural harbours of the world. It is within easy reach, by rail and by water, of the Comox and Nanaimo coalfields; its sea-approach up the Juan de Fuca Strait is wide, deep, and direct; the Olympian Mountains shelter it from the south-west gales, and help to give it a beautiful climate; it practically commands the whole coal-trade of the west coast as far as San Francisco, the salmon and gold trades of the British Columbian Rivers, and the fur trade of the Alaskan islands
- 4 The surface is naturally divided into three areas:
  - a high mountain system in the west, a low mountain system in the east, and a huge low plain in the centre.
  1. As the western highland meets the wet winds at their wettest, it condenses their moisture very suddenly and very completely, and it can store the moisture in huge glaciers. A large proportion of the rainfall drains away *eastward* through the depressions across the range, thus giving Canada the most useful system of inland navigation in the world; and the glacier reservoirs guarantee the supply of water even through the driest summer.
  2. Through the same depressions the warm S.W. winds—completely dried by the precipitation of their moisture—can pass on over the prairie, where, as the 'Chinook winds,' they have a very marked effect on the climate. And under the shelter afforded by the Rockies from the cold dry north winds, the warm wet Anti-Tradewinds make the climate of the west very mild, and encourage a magnificent forest growth, especially in the Cascade mountains. Cf. p. 114.
  3. The central plain, which is of very low elevation, separates the forest region of the Atlantic seaboard from the mineral wealth of the Rockies. It slopes down very gradually from the U.S.A. boundary to the Frozen North, and so has

absolutely no protection from the Arctic winds. It has also three 'steps' down from the Rockies to the centre—in Alberta, Saskatchewan, and Manitoba,—the temperature varying with the level and the distance from the mountains

4. The soil is rich almost everywhere except in the Frozen North; the level affords every facility for cultivation and transport; and the climate is very healthy for man and beast, the intense frost being also very useful for cleansing and pulverising the soil
5. As the low mountain system in the east is the water-parting between the Hudson Bay and the St. Lawrence, its position gives it a very heavy snowfall, and this makes it a great forest region, the cleared land being most suited to pasture.
5. The general level of the country and the depressions across the Rockies are most favourable to transport both by river and by rail

1. Montreal is the centre of a network of railways in the populous east, and Winnipeg is the 'pivot' of the great duplicated trans-continental railway system, which gives uninterrupted communication for trade or troops on British territory from the Atlantic to the Pacific, and is much the shortest route from England to Australasia, China, and Japan, there are rich coalfields and magnificent harbours at each end of the line, in time of war it has proved a much safer route to India than the Suez route, and much shorter than the Cape route. Edmonton is the pivot between the *C.P.R.*, the *Canadian Northern*, and the *Grand Trunk Pacific*.
2. The narrowness of the St. Lawrence basin compared with its length, the distance for which the river is navigable, and the character of the land along the banks, make the valley very important for both rail and river transport Cf p. 123.
3. The ~~Mackenzie~~ like the great Siberian rivers, flows from a warmer into a colder climate, which is fatal to its commercial prosperity. It drains a huge area, carrying off the surplus water of the Great Slave, Great Bear, and Athabasca lakes; but it does almost more harm than good, because throughout its lower course it is ice-bound for three-quarters of the year, while wheat can be ripened in its upper basin; and the melted snow from the latter, being checked by the ice in the former, floods the whole country for miles, eventually converting it into one enormous frozen marsh—a great source of furs.

4. The Fraser descends so precipitately from the Rockies that it is practically useless for navigation, though it can be navigated by moderate-sized vessels for 100 miles—up to the Yale rapids, but it teems with fish, its lower valley has been very useful in connection with the construction of the *Canadian Pacific Railway*, and its pace and its volume make it of great value for mechanical purposes.
5. As most of the rivers jump down the edge of the Laurentian plateau, they develop water-power at the falls, and often have long stretches of navigation (for canoes or light boats) between the falls.

6 Fur from 'land' animals was originally the staple product of Canada, but the Hudson Bay Company has hitherto confined itself to 'hunting.'

1. As a purely 'hunting' industry, it must speedily collapse (cf p. 9, § 3), but the wholesale destruction of the finer fur-bearing animals, *e.g.* otters and beavers, has already caused alarm, and a 'breeding' industry has already been developed. Cf. the ostrich farms of South Africa.
2. The areas most productive now, and most suitable for 'fur-reserves,' are the North-West Territories of Mackenzie, Keewatin, and Ungava (cf p. 127). The Hudson Bay Company still has two fur stations on Hudson Bay—Fort York and Moose Factory, and canoe traffic is feasible in almost all parts of the Mackenzie basin.
3. Furs, however, are able to bear the expense of rail transport; and there are Hudson Bay Company dépôts at almost every second station on the *Canadian Pacific Railway* between Winnipeg (the H B C. official headquarters) and Vancouver, Edmonton being the headquarters of the actual hunters and trappers at present.
4. Musk-rat is much the commonest species, followed by marten; mink, sable, and beaver are rare; and ~~lynx~~ and otter are in danger of being exterminated.
5. Since the prohibition of pelagic sealing, *i.e.* killing the seals at sea while on their way to or from the breeding grounds on the Pribilof Islands, the sealskin output has greatly diminished.

7. The fur-trade was, and still is, more or less bound up with fishing industries; and the latter have an importance beyond their mere commercial value.

1. The market value of the fish amounts to more than £7,000,000 a year, but that does not at all suggest the political importance of the industry. The cod fishery alone employs more than 50,000 men, who have formed an invaluable Marine Reserve in times of national danger.
2. Cod, herring, and lobster are the most important products from the east coast, where both ice and access to markets are most easily obtained; but mackerel, shad, and haddock are all plentiful. The chief centres are Lunenburg and Yarmouth, which are never frozen, and are conveniently situated for the despatch of the fish to the important 'Romanist' markets in the West Indies and Brazil. And the catch is much larger than appears from 'entries' at Canadian ports, for many boats put in to U.S.A. ports to avoid tariff difficulties; for instance, the N.B. herring boats take a large proportion of their catch to Eastport (Me) to be tinned as 'sardines'.
3. Salmon throng the tidal rivers, especially on the west coast, e.g. the Fraser and the Skeena, where the fiords are very sheltered; and magnificent halibut are caught off the Queen Charlotte Islands. The chief centre is New Westminster, but there is an immense field for development of fishing industries all along the British Columbia coast. In the meantime the output must be mainly tinned, and the small 'sock-eye' salmon—which is amazingly prolific and has deep-red flesh—is particularly suitable for tinning.

*NB*—There is a considerable trade in white-fish, trout, and sturgeon from the Great Lakes, especially Lake Huron and Lake Winnipeg.

8. Historically, lumber followed fur as the staple product of Canada; and forest products are still very valuable, though exported mainly in semi-manufactured form, including wood-pulp.

1. A belt of timber runs right across the country from ocean to ocean below the Tundras; but in the drier central region, especially towards the N.W., it is not very dense, and the cost of transport is prohibitive. The great commercial supplies come from the rainy west coast and the snowy eastern plateau, where the importance of the St. Lawrence for transport is illustrated by the fact that lumbering is still almost entirely confined to the basin of the river.
2. The eastern region extends from Lake Superior to Hudson Bay, and from Lake Winnipeg to the east of New Brunswick; the western region is practically the islands and

coastal district of British Columbia. The largest export is from New Brunswick, Quebec, and Vancouver Island.

*N.B.*—The 'lumber' trade owed its development to the fact that the supplies of timber from the Baltic to Britain were cut off during the Napoleonic wars.

3. Forests cover the north and north-east of New Brunswick, especially the basin of the Restigouche; the species of trees include spruce, cedar, and maple, the latter giving sugar as well as beautiful wood. The combination of hemlock-spruce forests and pasture round Fredericton has given rise to a large leather industry, and half the capital of N.B. is said to be invested in saw-mills at St. John.
4. Forests also cover almost the whole of Quebec from the Ottawa to the Saguenay, and the rivers are extremely useful both for floating the 'logs' and for driving the saw-mills. The species include red and white pine, spruce, and birch. The Ottawa brings down the pine, mainly from Lake Temiscaming, while the Saguenay brings down the birch, mainly from Lake St. John. The combination of hemlock-spruce and pasture has given the city of Quebec a very large leather trade, and Ottawa has—on the Chaudière Falls—the largest saw-mills in North America, the mill-hands going up country 'log-cutting' when the river is frozen. Three Rivers is a great exporting centre.
5. The western forests consist mainly of fir, cypress, and cedar. The Vancouver Island forests are the most productive and the most conveniently situated for export, but the great saw-mill centre is on the mainland at Vancouver. Over 80 per cent. of the output is the famous Douglas fir, a magnificent timber for masts and building purposes, and the presence of spruce and abundant water-power are developing wood-pulp industries.
6. The sub-arctic forests are mainly of spruce and poplar, which will provide unlimited quantities of wood-pulp, poles, fencing, etc., as soon as there is cheap transport available.
7. The chief 'timber' industries at present are at Ottawa and Deseronto, while wood-pulp is a speciality at Cincinnati, Sault Ste. Marie, and Grand Mere.

9. Agriculture is now more important than lumbering, producing over 25 per cent. of all Canadian exports.

1. Wheat is by far the most valuable grain, and the dry climate is peculiarly suitable for milling. The best quality, though no longer the most, comes from the bed of an old glacial lake which now forms the Qu'Appelle and Red River valleys,

and which is probably the best wheat land in the world; but all the prairie land of Manitoba, Saskatchewan, and Alberta has more or less ideal conditions of soil and climate and facilities for cultivation and transport.

The chief wheat-ports are Fort-William and Owen Sound, but the great centre of the wheat trade is Winnipeg, which stands at the confluence of two navigable rivers, and at the junction of the C P R main line, with at least eight other lines, including two U S A lines down the Red River valley. It is the meeting-point of east and west, forest and prairie, it commands the fur trade from the north and the grain trade from the south, in summer it has navigation up the Red River into the U S A, up the Assiniboine for more than 300 miles, and up the Saskatchewan to Edmonton—i.e. 1500 miles, including Lake Winnipeg. It is now the greatest wheat-centre in the world!

Other areas of the Great Central Plain, like the richer lowlands of the St. Lawrence basin, are quite suitable for wheat, but at present lack of population and deficient transport retard agriculture in the interior, and the destruction of timber in the St. Lawrence basin has given so much easier access to raw sea winds that the climate is less suitable for wheat than it was. Cf p 123, § 8 (1)

2. Barley and oats thrive along the north of the great wheat belt and in the eastern provinces (and nine-tenths of the total yield is 'fed' locally to animals); but the best barley comes from Ontario and the North Saskatchewan valley, while the best oats come from the maritime provinces, especially Prince Edward Island. The Ontario barley used to go to Philadelphia, where deposits of anthracite near the N.Y. hop gardens gave rise to a very extensive brewing industry; but the U S A tariff has killed the trade. The oats of Prince Edward Island, like the hay, are very useful in the breeding of horses, especially for the United States.
3. Where the heat and humidity are sufficient, maize is a staple crop, especially in the southern latitude and 'insular' climate of South Ontario, and the abundance of maize accounts for the large 'hog' industry. Cf the Ontario lard.
4. Nova Scotia produces the finest apples in the world on the salt-marsh of Annapolis and Minas Basin—where forest-clad hills keep off the fogs and storms from the north-east; the late spring prevents excessive making of wood, and the short autumn prevents waste of sap, while the hard winter kills the usual parasites; the dry climate is very favourable to the fruit both before and after picking, land is cheap, .



and markets are near—in the great cities of the eastern States. Of British imports of apples, one-third comes from Nova Scotia and Ontario.

5. The soil and climate of Ontario are nearly as favourable to apples as those of Nova Scotia, and the Hamilton 'peninsula' produces very fine peaches and grapes as well as apples—the low level, the almost marine climate, the latitude (that of Marseilles), and the friable shale, being all very favourable. Sugar-beet is also important in Ontario.
6. British Columbia produces pears that rival even those of California. The soil round New Westminster is exceedingly fertile, and the climate is so fine that even oranges will ripen in the open air; but the special product is pears, and the salmon-tinning industry provides all the necessaries for a tinned fruit industry.

Cf. the oyster tinning industry of Chesapeake Bay in connection with the tinned-vegetable industry of Maryland.

7. The lowlands of British Columbia and South Ontario are suited to many other crops, including hops and tobacco; hops are a speciality along the banks of the Fraser, and good tobacco may be grown on the parts of S E Ontario where fibrous soil (originally forested) overlies limestone.
- 10. Mining is much less valuable than agriculture, but at present the various minerals are scarcely worked except where there are special facilities for transport

1. This is most true of coal and iron, and least true of gold, gold being worked in very inaccessible regions, while the richest deposits of iron are untouched unless they are near coal and navigable water; and one of the three great coal-areas has been hitherto almost untouched because it is in the heart of the country.
2. In Nova Scotia coal is found both on the mainland and on Cape Breton Island, and in both places it is on or very close to navigable water. The island field is round Sydney, and is the nearest to Europe. The peninsula field is along Northumberland Strait, *e.g.* round Pictou, Joggins, and Springhill, and is the nearest to the Atlantic terminus of the trans-continental railway system; it is also side by side with pure limestone and very fine iron ore.

*N.B.*—Sydney is generally closed by drift ice for three months in winter.

In British Columbia coal is also found both on the mainland and on islands, but only the island fields are on navigable water. Comox and Nanaimo are nearest to

the Pacific terminus of the trans-continental railway, but the Queen Charlotte Islands have the best coal, especially the anthracite of Skidegate Inlet

The coal in the North-West Territories is generally of poor quality, but of enormous extent and invaluable for opening up the country. Much the best quality is found round Calgary, especially at Banff, Cochrane, and Lethbridge, ~~i.e.~~ just where the C.P.R. begins to ~~climb~~ the Rockies; but the main line would probably have gone by the easier gradients of the Crow's Nest Pass, if the existence of the really good coal there had been known at the time.

3. There are literally enormous quantities of iron, and the magnetic and hematite deposits of Ungava—which *might* be smelted by the peat and sub-arctic timber of Labrador—are equal in quality to the best Swedish and Spanish ore; but at present the deposits are not worked except where there are the most facilities for transport and smelting.

These facilities are greatest at Sydney (C.B.) and along the shores of Nova Scotia, where the carboniferous limestone contains good ore, which is worked at New Glasgow, Truro, and Londonderry. The fine ore of Ontario is being worked at Hamilton and Kingston (locomotives), where coal can be easily imported across Lake Ontario; and local and river-borne ore is worked at Montreal, which, as a great transport centre, has developed the largest iron and steel industry of any single city in Canada.

*N.B.*—The fine ore of Michipicoten (Ont.) is even being exported to U.S.A.

4. Petroleum is worked in Ontario, especially round Petrolia and London, and in the N.W.T., where it is destined to be of very great use. The oil-field of Edmonton, like that of Pittsburg, supplies large quantities of natural gas, especially at Medicine Hat and Bow Island.
5. Gold is mainly found in the Cordilleran area, especially along the Fraser, Columbia, and Yukon rivers, and the abundance of water and timber gives the British Columbian miners a great advantage over their rivals in almost every other part of the world, especially in West Australia. The chief centres are the Cariboo district of the Fraser basin, the Kootenay district of the Columbia basin, and the Klondyke district of the Yukon basin. Rossland is the present Columbia centre, but the richest mines are in the West Kootenay district, to which there is access by river-steamer up the Columbia and by rail *via* the Crow Nest Pass. The ore naturally goes by the former—to be smelted at Trail or Nelson. The annual output is decreasing (*c.* £2,000,000).

In summer the Klondyke fields also can be reached by river-steamer from St. Michael's, which is on the north mouth of the Yukon, but in winter there is no communication at all, and even in spring and autumn the passes across the Rockies from Juneau are difficult and dangerous. Dawson, at the confluence of the Yukon and the Klondyke, is the great centre, and can be reached in three days by river-steamer from Lake Bennett (June to September); but there is difference of opinion about the route to Lake Bennett, the best being probably that by the Lynn Canal *via* Skagway (U.S.A.) and the short White Pass railway. The 'all-Canadian' route goes by the Stikine river *via* Telegraph Creek and the wagon-road to Lake Teslin.

Gold is also found along the coast of Nova Scotia, especially at Stormont, Brookfield, and Caribou, and along the Ontario shore of Lake Superior, *e.g.* at Michipicoten.

- 6 Silver is found in most of the gold districts; but the richest mines are those of Cobalt (Ont.), other centres being Slocan, in the Kootenay basin, and Forty Mile River, in the Yukon basin, where the silver is found along with lead and close to fields of lignite.
7. Copper is worked in Algoma, especially along the north shore of Lake Huron, and close to the C.P.R. branch-line from Sudbury to 'Soo'; but the richest mines are in the Rossland goldfield. About 40 per cent. of the world's output of nickel comes also from the Sudbury district.

*N.B.*—The famous asbestos deposits of Quebec are round Thetford, and the B.C. cinnabar is near Kamloops.

11. The various pastoral industries are relatively less important than they were, accounting for scarcely 20 per cent. of the total exports.

1. The impossibility of competing with Manitoba in the production of wheat forced the eastern provinces to turn to mixed farming, for which their soil and climate are most suited; and the intense dryness of the air on the eastern slopes of the Rockies made it practically impossible for anything except pasture to be profitable. Consequently, these two areas are the source of the great pastoral products (cheese only in summer, butter in winter) as well as of the great export of dressed poultry (chickens and turkeys).
2. Of the maritime provinces, Nova Scotia has the mildest climate and most facilities for export; Prince Edward Island produces very good grass, partly owing to the

valuable deposits of 'mussel-mud' manure found off the shore; New Brunswick has dyked lands along the Bay of Fundy, which produce rich crops of grass under the natural manure of the sea-floods. These provinces are, therefore, specially suited for butter-making and for 'preparing' live animals for export. They supply large numbers of live cattle and of horses (*e.g.* for 'bus and cab purposes in England'), and cattle from the interior, 'finished' on the sweeter grass of the marine climate, lose some of the inferiority which 'continental' meat almost always shows.

3. Ontario, which in climate is almost a 'maritime' province, is the largest exporter of cheese in the world, its soil is splendidly watered, and carries heavy crops of roots; and the climate is eminently suited to cheese-making, in respect of prime quality and of uniformity—a very important item.
4. In Alberta the number of streams, the slope of the land, and the climate, are all extremely favourable to cattle-pasturing, especially round Calgary. In the east of Canada the snowfall necessitates the housing and artificial feeding of the cattle in winter, but the Chinook winds greatly modify the climate of Alberta, and the district is too dry to have a heavy snowfall. The dryness—which is so intense as practically to prevent grain ripening—converts some of the natural grasses, *e.g.* the 'Buffalo' and the 'Bunch' grasses, into hay while they still remain uncut. Consequently, the cattle can generally feed over the ordinary pastures in winter, thus getting exercise in the fresh air and requiring little or no housing or house-feeding.

*N.B.*—The western cattle can be easily sent to the river lowlands, especially round Edmonton and Prince Albert, to be 'finished' at Regina, where the cattle-ranches of the 'plains' and the grain-fields of the 'prairies' meet, is an important market. Calgary is a very important centre.

## 12. The small population, and the attraction of high wages in the States, have retarded manufactures.

1. Montreal is the chief manufacturing centre. As a great river and rail junction between huge forests and busy mixed-farming areas, it has very important iron-works, specialising in locomotives and steel-rails, agricultural implements and 'cutlery' (*e.g.* axes), and its nearness to the forests gives it a large leather industry, specialising in harness, etc. It refines maple and cane sugar, and has textile industries (wool and cotton).
2. Leather has long been a speciality at Fredericton and Quebec. Fredericton, though standing at the head of navigation for large steamers on the St. John and at the lowest point at

which the river is bridged, is mainly a tanning centre; Quebec, which is a dozen times as large, and has a big 'transit' population (mainly immigrants), specialises in boots and shoes. Cf the famous birch-bark canoes.

3. Textile industries are, of course, not naturally suited to the climate, but southern Ontario combines a dense population with an almost 'insular' climate, and coarse cottons and woollens are made at nearly all the important centres,—Toronto, Kingston, London, etc
4. London,—which stands on an oilfield, at the confluence of the two branches of the Thames and commanding the two great routes from Toronto to Chicago,—does also a good deal of milling and tanning, but its special industry, like that of Sarnia, is oil-refining. And Toronto has an important cement trade in connection with the rich deposits of marl and 'cement-clay' near Orangeville.
5. The great lard centres are Collingwood, Peterborough, and the whole district from Toronto to Ingersoll, especially Brantford and Hamilton. Minas is the chief hay centre.

### Newfoundland and the Bermudas

1. THE value of the Newfoundland coast for fishing is very great, both round the island and along the 750 miles of Labrador that belong to Newfoundland.

1. One-third of the whole population (about 240,000) is engaged in the fishing industry, and the export of fish products is 8 or 9 times as valuable as that of all the other products
2. Of course, the cod fishery is much the most important. It is so largely confined to the Great Bank that the fishermen are known locally as 'Bankers.' The season lasts from June to the middle of November, and even the processing of bait (capelin, squid, etc.) has become a definite industry.

*N.B.*—The 'Bait-Laws'—being almost the only defence of the Newfoundlanders—were used most effectively against the French 'Bankers.'

3. The seal fishery comes next in importance, but is carried on solely for oil and skins, the seals not being of the fur-bearing kind, the season is from the middle of November to June, and the hunting grounds are the ice-floes along the coast of Labrador.

- 4 Amongst the other fish products are lobsters, herring, and salmon. Lobster-canning, which is a rising industry, was formerly another cause of difficulty with the French; the herring are most plentiful in Fortune Bay, and the salmon off the Gulf coast.
- 5 St John's is the only harbour of any importance. It is so deep that the largest vessels can enter at any state of the tide, but the entrance is so narrow that only one vessel can enter at a time; it is less than 1700 miles from Ireland, and the peninsula of Avalon has the best climate in the colony; and it is the headquarters both of the cod fishery and of the seal-hunting.

*NB*—Miquelon and St Pierre belong to France, but the French have now renounced their claim to exclusive shore rights from Cape Ray to Cape Bonavista via Belle Isle Strait—a distance of 450 miles on the most sheltered part of the coast.

2 The surface of Newfoundland is rough and hilly, and the climate is very unpleasant.

1. Owing to the presence of sea on every side, the extremes, even in the portion of the country farthest from the influence of the Gulf Stream, are not nearly so great as in Canada, the thermometer seldom falling below zero, but the meeting of the cold Labrador current with the warm Gulf Stream causes constant fogs.
2. With such a surface and such a climate, agriculture is impossible except in a few favoured places round the coast and along the lower valleys of the rivers; indeed, fully one-third of the entire surface is covered with lakes and marshes. Consequently the population is extremely limited, and the only place except St John's that is more than a village is Harbour Grace.
3. A few thousand men are, however, employed in various mining industries. Copper is worked round Placentia Bay, and there are deposits of gold, silver, and lead, in the east, and of coal round St George's Bay; but the chief mineral wealth is in iron, especially on Bell Island. The beds of red hematite at Wabana are exceedingly rich, and very easily worked and exported.

*NB*—Trinity Bay and Cape Race are cable and 'wireless' stations.

4. The only other industry of any importance is lumbering. Timber, mainly pine, is found along most of the rivers, e.g. the Exploits and the Humber, and the amount of water-power is favourable to the development of the industry. Unfortunately, however, some of the best timber, like some

of the best agricultural land, was found along the disputed western coast; and access to it from the land side was formerly practically impossible.

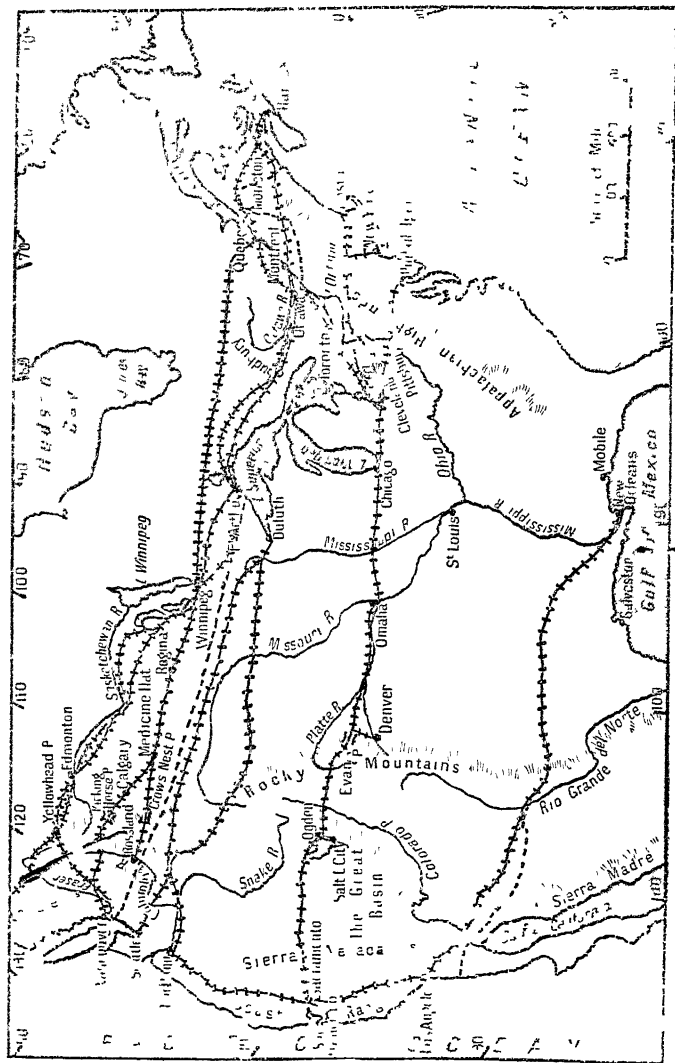
*NB*—Quite recently a railway has been constructed right across the island, and this will probably give a great impetus to the various land industries, *e.g.* working the Grand Lake coal

5. The industries dependent on the fisheries include—besides fish-curing—the making of cod-liver oil, glue (from fish-skins), and fertilisers (from fish refuse)

3. The Bermudas are of coral formation, and—thanks to the Gulf Stream—in a higher latitude than any other similar group in the world

1. The coral formation is so porous, and the islands are so small, that there are no fresh-water springs, and, therefore, the water supply for drinking purposes depends on rain. The Gulf Stream gives the islands a wonderful climate; the variation of temperature is very slight from winter to summer, and frost is unknown
2. There are about 360 islands altogether, but only about 20 are inhabited. Their climate makes them a favourite winter resort for the Americans, and in spring the 'market-garden of New York'; and their position and their good harbours, especially St. George and Hamilton, make them an important commercial and naval centre.
3. The products are entirely vegetable raw-materials. Arrow-root, formerly the staple product, is now unimportant; and its place has been taken by onions, potatoes, and tomatoes. The most important fruits are melons and bananas, and the most important wood is the red 'cedar'—for pencils. There is also a large export to U.S.A. of lily-bulbs and blooms (for Easter decorations).

*NB*—The islands would be greatly helped by a political and commercial union with the West Indies on the one side, and with Canada on the other. Cf. p. 163, § 10.



NORTH AMERICA (TRANSCONTINENTAL RAILWAYS).



## United States.

1. COMMERCIALLY, the Atlantic coast is the most important, owing to its facilities for foreign trade.

1. It is twice as long as any other, mainly owing to its deep indentations ; it is the nearest to Europe , it has very good communication inland, up the Hudson Valley and across the detached part of the Alleghany Mountains , it has rich deposits of coal and iron just behind its best natural harbours , and these harbours are practically free from ice the whole year round.
2. The Lake coast is, however, even more important than the Atlantic coast for home trade, and it has abundance of timber and of minerals, including coal and iron , but it is naturally ice-bound in winter.
5. The Gulf coast is low and sandy, and has no mineral wealth of its own , but the natural slope of the Mississippi basin brings it an immense amount of trade both by river and by rail, the fertility of the region amply repays outlay on artificial harbours, and ice is unknown . It is also the most important of all the coasts climatically, as it supplies rain to half the country.
4. The Pacific coast has the most genial climate of all, but it is curiously deficient in harbours, and is backed for a considerable distance by desert. Consequently, the harbours which do exist—S. Francisco, Puget Sound, Portland, and S. Diego are very important, and great prominence is given to rail transport
5. The character of the land boundary towards Canada allows a large amount of trade to leave the country *via* the St. Lawrence and by rail.

2. The 'relief' resembles that of Canada generally—a huge plain between two mountain systems—but has important variations. .

1. The general slope of the plain is from north to south, not from south to north ; this has the advantage of being from

a colder to a warmer latitude, and it naturally takes both river and rail traffic to the Gulf coast. It also admits the rain-bearing S winds to the whole of the Mississippi valley—one main cause of the great productiveness.

*NB*—The one drawback is that it exposes the country to blizzards in winter and tornadoes in summer—which are unknown in Canada.

2. As the country is entirely within really temperate latitudes, extremes of climate must be due to other causes than latitude, and the rainfall, though small, is so well distributed throughout the year that it is sufficient in almost every region for 'temperate' agriculture
3. It has its chief plateau system in the west, not the east, which indirectly causes the chief water-parting to be deficient in glaciers, and, therefore, the rivers vary greatly in volume.
- 3 All kinds of grains are grown, from rye to rice; but wheat and maize are much the most important.

1. The volcanic plateau of Washington and Oregon, especially the Willamette valley, and the alluvial plains of Minnesota and California, especially along the Sacramento and S. Joaquin, produce the best wheat, but the largest amount comes from the Dakotas, Ohio, and Indiana. Duluth and Milwaukee are the natural outlets for the Minnesota and Dakota grain, and Chicago and Toledo for that of Indiana and Ohio, but a very large quantity goes by rail to New York, even from Dakota—partly to save transshipment (for export), and partly because it is required for home consumption in the N E States.
2. As Maize—the only indigenous grain of the New World, and the most important for the U S A. home market—requires more heat and more moisture than wheat, it is grown mainly on river 'bottoms' south of the wheat area. The most productive areas are the south of Iowa between the Missouri and the Mississippi, the 'peninsula' of Illinois between the Ohio and the Mississippi, and the whole State of Missouri, in which the three rivers meet, but it is also grown in the 'peninsula' of Nebraska and Kansas that is shut in by the Platte, the Missouri, and the Arkansas. It is convenient access to these enormous stocks of maize that has made Chicago and Cincinnati the two largest 'hog' markets in the world.

*NB*—Maize is not exported to the same extent as wheat, partly because it is very bulky for its value, and partly because in Europe it is not much used except for feeding beasts

3. Oats, mainly for horses, and barley, mainly for brewing, are largely grown in the densely-peopled States along the Great Lakes, and very fine bailey is also grown in California. Excellent rice is grown in Carolina, Texas, and the Louisiana swamp, and in the latter area much heavier harvesting machinery can be used.

*N.B.*—The two barley districts and the west of Washington also grow large quantities of very excellent hops, cf. the famous Milwaukee beer, and the Northern States grow quantities of rye—used hitherto for distilling 'whisky'.

4. The tract of rolling grass-lands west of the Mississippi, from Iowa to Texas and from New Mexico to Missouri, already supports 40,000,000 cattle, mainly in the North Central States

1. The meat from this area is not of the very best quality, and the distance from good markets is immense, but the latter fact helps to make the land very cheap, and has encouraged the 'preserving' of the meat. Live animals can be 'finished' on the river 'bottoms' of the Corn Belt, and—except in special cases, *e.g.* during the war—only the best quality of the meat is exported (dried, tinned, salted or 'chilled').

*N.B.*—These 'river' bottoms also produce, like the 'Dairy' States of the Ohio basin, quantities of hay. Cf. the Californian lucerne.

2. The large number of cattle (41 p.c.) raised in the Corn Belt, especially round Lake Michigan—in Iowa, Missouri, Illinois, and Kansas—is due to the great facilities for exporting and the abundance of maize. As the population in this area is thinner than in the N.E. States, the smaller demand for milk furthers butter and cheese industries.
3. Besides these cattle, a very large number of sheep are raised in the more mountainous States farther west, from Montana to New Mexico and from Wyoming to Oregon; the finest wool on the continent comes from the Oregon and Californian sheep-farms, and wool is more important than mutton on the Alleghany sheep-farms.
4. The great local markets are on the eastern border of the 'cattle-belt,' *e.g.* Kansas City and Omaha, which sprang into importance as soon as railways from the east reached them.
5. Large numbers of mules are reared in the south, where the climate is less favourable to horses. The best horses come from Kentucky, but by far the largest numbers are found in and around the great cities of the N.E.—where they are in demand for draught purposes, and supply the best skins for certain kinds of leather (*e.g.* for razor-strops), and hair for upholstery.

5. The eastern half of the country is the most important producer of fibres and tobacco in the world

1. Flax, the hardest and least important, comes mainly from the Mississippi 'lowlands' of Minnesota, Iowa, and Illinois, especially round Davenport and Duluque, and it is grown chiefly for oil. Cf. the Saskatchewan industry.
2. Cotton, the least hardy and the most important, comes mainly from Texas, Georgia, Mississippi, Alabama, and South Carolina—Carolina and Georgia producing the best Cf p. 114
3. Tobacco is grown from Wisconsin to Louisiana—which grows the famous 'peruque'; but by far the most important plantations are in Kentucky and Virginia and their southward neighbours, Tennessee and North Carolina

6. The more 'marine' parts of the country produce very large quantities of fruit, especially apples, oranges, and grapes.

1. The best apples come from New York and Pennsylvania, where the climate is almost 'marine' in summer, but completely 'continental' in winter (cf. p. 125) Delaware also produces large quantities, but the softer climate makes peaches the special product, as in Maryland and on the Michigan peninsula
2. The climate of Florida enables even pine-apples to be ripened in the open air, but the great crop is oranges. The latter are also grown in Carolina (cf p. 2) and S. California.
3. The special crops of California, however, are grapes, pears, and prunes. The vine grows to perfection in the Tulare basin; and California supplies half the wine consumed in U.S.A., as well as brandy and excellent raisins.

*N.B.*—The value of the vineyards depends, not on their size, but on their access to irrigation—this being of supreme importance even on the coast, e.g. round Los Angeles

7. Timber is a very important product in the N.E. and N.W., where there is much the heaviest fall of rain and snow, and on the humid peninsulas of Michigan and Florida.

1. The chief timber States are (for 'soft'-wood) Maine, Michigan, and Washington. The finest qualities are the Douglas fir of Washington (and Oregon), and the white pine of Michigan (and Wisconsin); the much less valuable spruce and

poplar of Maine (New Hampshire and the Adirondacks) supply enormous quantities of wood-pulp to Albany and Boston. Cf. the export of Seattle and Tacoma

*N.B.*—Canadian timber is also imported, especially at Oswego and Tonawanda (the Erie Canal terminus)

2. South of the Ohio and east of the Mississippi there is a large area of 'hard'-wood timber, which gravitates to St. Louis, New Orleans, and Memphis for export, and which supports a large home industry in casks (oak) and barrels (elm)
3. Florida produces the so-called 'cedar' (juniper), which is exported from Pensacola and Jacksonville to various pencil-making centres of Europe, and Florida, Georgia, and Carolina produce yellow pine, the best source of turpentine

8 The country contains two fields of real coal, the Appalachian and the Central, of which the former is much the larger and the more valuable.

1. The Appalachian coal is of three kinds anthracite to the east of the mountains, bituminous to the west, and semi-bituminous between the other two.
2. The anthracite lies along the banks of three rivers along the Susquehanna between Scranton and Wilkesbarre, along the Lehigh round Manch Chunk, and along the Schuylkill round Pottsville, and the valleys of these tributaries of the Delaware give easy access to Philadelphia. Cf. p 125 (2).
3. The semi-bituminous coal is most abundant along the Potomac at Cumberland, but the field is not a large one.
4. The bituminous coal is found along the whole length of the western slope of the Alleghany Mountains, from Pittsburg to Birmingham, and is everywhere on or quite near to navigable water. The richest deposits are along the Ohio and the Monongahela, especially round Pittsburg, Wheeling, and Connellsville (coke), but the Alabama deposits are proving much richer than was expected. Water-transport is improved by artificial floods (from reservoirs) on the Ohio
5. The central field is much smaller and less valuable, but is very useful to Chicago and St. Louis. Its centre is at Terre Haute, where the railway from Indianapolis to St. Louis crosses the Wabash River.

9. There are also valuable supplies of oil and natural gas, both of which are so clean and so cheap that they are taking the place of coal, *e.g.* in iron and glass works

1 The gas is very abundant round Pittsburgh. The oil, which is of good quality, still comes from the valley of the Alleghany and along Lake Erie, *e.g.* Bradford, Cleveland, and Oil City, but even Illinois is three times as productive as Pennsylvania or Ohio, and yet far behind California and Texas, it is conveyed in pipes for hundreds of miles, *e.g.* to Philadelphia, New York, and Port Arthur (Texas). Cf. p. 115.

10. Good iron ore is abundant in both the great coal basins, but the richest deposits are along Lake Superior.

1. The 'Lake' ore supplies four-fifths of the total amount of iron, it is of excellent quality, and there are exceptional facilities for shipping it—the Vermilion and Mesabi ore can be shipped from Two Harbours and Duluth, the Gogebic ore from Ashland and Superior, the Marquette ore from Marquette and L'Anse, the Menominee ore from Escanaba and Gladstone. The last two ports are very convenient for Milwaukee and South Chicago, but all the other great receiving ports are on Lake Erie, *e.g.* Conneaut, Cleveland, Ashtabula, Fairport, Lorain, Huron, Sandusky, etc. Cf. p. 115.

2. The Alleghany centres are along the Ohio between Ironton and Marietta, and in the upper basin of the Alabama, especially round Birmingham, which has easy access to the manganese deposits of the Southern States, especially since the improvement of the Black Warrior navigation and the opening of a canal from the Mississippi to the Gulf *via* Lake Borgne. Alabama raises 10 p.c. of the total U.S.A. output.

3. As almost the whole Alleghany region is rich in good limestone, 'flux' can be got easily everywhere.

11. The country is very rich in precious metals, especially in the Cordilleran system, and in copper.

1. The gold output was valued in 1911 at £20,000,000. Colorado, Alaska, California, and Nevada are much the largest producers, Montana, South Dakota, Utah, and Arizona producing usually between them less than the single State of Colorado. By far the richest mines are at Cripple Creek, in the Puebloan corner of Colorado. Cf. Denver.

2. The silver output averages just about one-third the value of the gold; the chief producers are Colorado, Utah, and Montana, and the special centres are Leadville and Butte City.

3. Montana, Arizona, and Michigan are the great copper States. The Keeweenaw mines are quite close to the port of

Houghton, but those of Montana are the richer, especially round Butte and Anaconda. Utah also is rich in copper.

4. Among the other minerals—which are mainly of local importance—are the mercury of New Almaden, the graphite of Ticonderoga, and the lead of Leadville; salt (*e.g.* from the brine-wells of New York and Michigan and the lagoons of California), sulphur (*e.g.* from the volcanic area of Utah and Nevada), zinc (*e.g.* from the Kansas-Missouri frontier, cf p 145), and phosphate fertilisers (*e.g.* from Florida, South Carolina, and Tennessee).

## 12 The United States have the greatest manufacturing industries in the world.

1. The vast area makes the country almost self-sufficing, and gives the older and newer centres almost the relations of mother country and colony for instance, surplus raw materials of the thinly-peopled prairies, plains, and cordilleras are exchanged for surplus manufactures of the densely-peopled 'coal and iron' States of the N E.
2. The great wealth in coal and iron, and the abundance of water-power, especially in the 'Atlantic' States, have given almost unique facilities for manufacturing on an enormous scale, *i.e.* cheaply; for instance, the difference in cost between raw and refined sugar is so little that refining pays only when done with very large 'plant.' This is the main cause of the number of 'One-Trade' towns in U S A., *e.g.* 'meat' of South Omaha (90 per cent of all the products of the town), pottery of East Liverpool (87 per cent.), hats of Bethel (86 per cent.), cuffs and collars of Troy (85 per cent.), glass of Tarentum (81 per cent.)

*N.B.*—This dependence on a single industry is very dangerous.

3. Enormous accumulations of capital, great inventive genius in the people, 'tariff' exclusion of foreign competition, and the energy and good education of the people, have still further emphasised the natural advantages of the country.

## 13. Textiles are of the greatest importance as employing the largest number of hands—but the climate is generally unsuited to the finest textile work.

1. The cotton industry has its chief centre in New England, but is carried on under the most favourable conditions in the cotton-producing States along the Atlantic; and the easy access to the raw cotton and the cheaper labour will

eventually transfer the great mass of the industry to the S.E. States, where the cheap labour is *White*, not Black.

Massachusetts is at present the chief textile State. Its climate, especially round Narragansett Bay, is more favourable to the industry than that of any other State equally well placed for importing cotton and obtaining cheap fuel and machinery; and it has exceptional facilities for water-power. Fall River, the busiest centre, has the most humid climate (cf cottons of New Bedford and Providence); Lowell, Lawrence, Manchester, and Nashua are all on the Merrimac; Augusta and Waterville are on the Kennebec; and Biddeford is on the Saco.

The chief S.E. centres are Atlanta and Augusta, which use the water-power of the Blue Ridge; and the convergence of many railways at the end of the Appalachian highlands gives easy access to the coal and iron of Alabama. The climate, too, will favour much finer work than the coarse calico, sheeting, shirting, etc., of New England; the Falls of the Savannah will probably enable Augusta to surpass all other centres.

2. The woollen industry has considerable division of labour, *e.g.* cloth, carpets, worsteds, and felting. Easy access to coal and iron and the fine wool of Pennsylvania have made Philadelphia the largest woollen centre, carpets and cloth being the special products, as at Camden and Chester; but Boston is the chief market for the large imports of foreign wool, and the water-power of Massachusetts has attracted most of the woollen industries. Lawrence and Lowell, with their neighbours, Providence and Manchester, make cloth; and Lowell and Hartford make carpets.

The worsted mills make a speciality of knitted goods, at Cohoes, Johnstone, Gloversville ('gloves'), and other N.Y. towns, including N.Y. city, and felting is a speciality in Connecticut, especially at Bethel. Cf Louisville 'jeans.'

*N.B.*—Hat-felting is now being made almost entirely of hare and rabbit 'fur,' three-fourths of the total output of hats at Bethel being 'fur.'

3. The silk industry is widely scattered, but most of the mills are in New Jersey, New York, and Pennsylvania. The great centre is Paterson, N.J., where ribbons are a speciality; but West Hoboken, N.J., is the most entirely a 'silk' town, nearly 80 per cent. of its products being silk.

14. Iron and steel goods, which employ well over 1,000,000 hands, are made on the coalfields which produce most pig-iron—from local or imported ore.



1. Pennsylvania stands easily first in this industry, some towns, *e.g.* Mackeesport, having practically no other industry, and Pittsburg—which stands at the confluence of two navigable rivers in the centre of a region rich in coal, iron, oil, gas, and limestone, is the natural 'hardware metropolis.' Alleghany, its twin town, has direct water communication by river, canal, and lake with the Michigan iron

*NB*—The presence of excellent glass-sand in the Ohio valley has led to the largest glass industry in U.S.A. Cf. Tarentum and Muncie

2. The typical product is machinery, especially automatic machinery with interchangeable parts. The three great cities of Philadelphia, Chicago, and New York, lead in this; but a number of others are engaged in it, including Providence and Worcester (textile machinery), Buffalo and Erie (milling), St. Louis and Cincinnati (meat-packing)
3. The enormous distances led to a great development of railways—the low rates on which are partly due to the comparatively small cost of the *single track* system; and locomotives and other railway plant are special products in great transport centres, *e.g.* Philadelphia, Pittsburg, Chicago, the Paterson suburb of New York, the 'Mohawk Valley' junction of Schenectady, and Omaha, where the *Union Pacific* begins to climb the Rocky Mountains.
4. Ship-building is most important on the Delaware and Chesapeake estuaries, *e.g.* at Philadelphia, Wilmington, and Sparrow's Point, which have easy access to coal, iron, etc., and on the Great Lakes, *e.g.* at Cleveland and Superior, there are yards also at S. Francisco, Newport News, and Bath (steel sailing vessels). The U.S.A. armoury is at Springfield.

*NB*—Wilmington has the largest gunpowder works in the New World

5. Agricultural plant and implements are most important on and near the coal-and-iron centres nearest to the prairies. Chicago makes nearly three-fourths of all the harvesting machines used in the world, and an immense number of trucks, etc., for its huge grain and meat traffic. Various other towns along the great lakes and in the Ohio valley, *e.g.* Buffalo, Cleveland, Erie, and Cincinnati, share in the industry. Cf. Louisville wagons, ploughs, and saddles.

## 15. Slaughtering and packing meat is much the most important 'food' industry.

1. The great centres of this industry are in the 'Corn Belt,' where the animals can be 'finished' for the market most quickly and cheaply. Omaha, Kansas City, Chicago, and

Cincinnati are the most important, 90 per cent of all the wage earners in Omaha being employed in slaughtering or packing, Atchison, Sioux ('Soo'), St. Louis, Indianapolis, Cleveland, and Milwaukee are also very important.

*N.B.*—Textiles, 'iron,' and 'meat' are the only industries of first rank.

16 'Timber' is credited with an output-value of over £300,000,000.

1. Cut timber is of course the chief product—the kind varying with the locality. Chicago—the largest lumber market in the world—and Grand Rapids specialise in white-pine; Albany and Boston specialise in spruce; New York and Philadelphia specialise in hemlock; St. Louis and Louisville in oak and other 'hard' woods; New Orleans specialises in cypress, and Charleston in yellow-pine.
2. The chief dependent industry in the spruce areas, where the water is very soft and pure, is papermaking. Most of the 'newspaper' mills are naturally in and near New England, *e.g.* at Portland (Me.), but the industry is also important in Wisconsin and Oregon, *e.g.* at Portland (Ore). Holyoke, the centre of the U.S.A. paper industry, has the special advantages of water-power from the Connecticut, wood-pulp for newspaper, etc., from the Hoosac forests, and easy access to textile waste (linen and cotton rags) for writing paper and other fine grades.

*N.B.*—Paper products imp'ov over 60 p.c. of the U.S.A. water-power

3. The hemlock areas have dependent tanning industries, especially in 'cattle' centres. Philadelphia has the largest leather industry in the world, but other cities on the edge of hemlock areas, *e.g.* Rochester and New York, or within easy reach of them by water, *e.g.* Chicago and Cincinnati, have large tanneries. The most congested centres of population, *e.g.* New York, Philadelphia, Chicago, Cincinnati, and St. Louis, naturally have the greatest boot and shoe industries; but some small towns have special facilities, *e.g.* Rochester, on the Genesee Falls, and various 'suburbs' of Boston, especially Brockton, Lynn, and Haverhill—three-fourths of all the products of Brockton being boots and shoes. Bookbinding is a speciality in Boston itself.

*N.B.*—The various leather products are valued at fully £200,000,000.

4. In the hardwood areas coopering and the making of carts and agricultural implements are most important, especially at Dayton, and coopering is also important at all the large flour and sugar centres, *e.g.* Minneapolis, Chicago, and Detroit (also famous for brass-work). Cf. Nashville

5. Furniture industries are found in all the great cities, particularly in New York and Philadelphia, but they are most important in the pine district. Chicago is the chief centre, especially for office furniture, but furniture is a most valuable output at Grand Rapids, Saginaw, Muskegon, and Bay City. In the southern pine belt Memphis and Montgomery are the chief furniture centres, while Wilmington and neighbouring N.C. towns, *e.g.* Newbern and Beaufort, distil spirits of turpentine and prepare resin for market.
17. Milling is usually almost as important as the meat industry.
  1. Minneapolis, just below the St. Anthony Falls, on the northern edge of the hard 'spring' wheat belt, is the largest milling centre in the world. The climate is entirely continental, but the city is so near the Great Lakes that railway rates have to compete with the rates by water, and there is the further competition of at least three railways from St. Paul to Duluth.
  2. The chief rivals of Minneapolis are Rochester, where huge flour-mills are driven by the Genesee Falls,—Superior, which can ship the flour direct,—Buffalo, which uses Niagara, and St. Louis, which commands all the wheat traffic down the Missouri and the Mississippi. Cf Louisville
18. There are various other metal industries, the most important of which is 'tinning' Cf p. 142.
  1. Tinning ('canning') is exceedingly important, and has numerous branches—*e.g.* meat, in the Corn Belt, especially at Cincinnati and Chicago; milk, in the dairy States, especially New York, Ohio, and Illinois; salmon, on the Pacific coast, especially at Astoria (local) and S. Francisco (Alaskan fish); 'sardines' near the Maine herring fishery, especially at Eastport; oysters on Long Island Sound and Chesapeake Bay, *e.g.* at New Haven and Baltimore (64 p.c.); vegetables and fruit (especially peaches) on the Delaware and Chesapeake estuaries, *e.g.* at Camden and Baltimore; tobacco in Virginia, *e.g.* at Norfolk and Richmond.
  2. The New England rivers supply water-power for a great number of metal industries. The Naugatuck valley is specially famous for brass and other copper alloys, especially in the form of Waterbury and Ansonia watches; Meriden produces one-third of the plated ware of the country, New Haven makes cutlery, and Hartford is noted for pistols

(‘Colt’s’) A number of towns round Narragansett Bay specialise in jewelry, especially Providence (silverware), Attleboro’, and North Attleboro’, three-fourths of all the products of the last town being jewelry. Nearly all the large cities have gold and silver industries, especially New York, Chicago, and San Francisco.

*NB*—The great deposits of zinc are in New Jersey, *e.g.* near Franklin, in Pennsylvania, *e.g.* near Bethlehem, and in Missouri, *e.g.* at Joplin.

19. Various ‘chemical’ and allied industries, as usual, are attracted to coal and salt

1. The bituminous coal and oil fields of Pennsylvania are the main source of the aniline dyes, vaseline, lubricating oils, and other by-products of coal and petroleum. The largest oil-refineries are at Philadelphia, New York, and Baltimore; but Buffalo and Cleveland are also important. Cf. p. 139.
2. More than two-thirds of the salt comes from the States of New York and Michigan, Kansas coming third. The richest deposits in N.Y. are round the junction of the Erie and Oswego canals, where Syracuse is the natural centre (cf. the salt of Ithaca); the richest Michigan deposits are between Saginaw Bay and Grand Rapids, where the railway from the great meat-packing metropolis of Chicago crosses the Grand River. In Kansas, the great centre is Salina, on the ‘Great Saline’ river.
3. Various ‘clay’ industries for bricks, tiles, and pipes, etc., are important in all parts of the country, especially in Massachusetts (at Martha’s Vineyard), in Vermont (at Brandon and Bennington), and in New Jersey (from Perth Amboy to Trenton); but the china industry is practically confined to the kaolin beds of New Jersey and the Ohio valley, especially Zanesville, Trenton, and East Liverpool, where nearly nine-tenths of all the products of the town are pottery.
4. The Ohio valley has also the richest deposits of sand suitable for the manufacture of glass, especially in Pennsylvania and Indiana. Pittsburg is the largest centre, but Tarentum is the most entirely a ‘glass’ town, four-fifths of its products being glass. Wheeling and other towns are also important.
5. The country is rich in various fertilisers, *e.g.* the marl and phosphates of the S.E. States, and the gypsum of New York (Niagara to Oneida), Michigan (Grand Rapids), and the Rocky Mountain States. The gypsum is, of course, useful in many other ways, *e.g.* for stucco, plaster of Paris, etc.

20. Other important industries not directly connected with local deposits of coal, are in tobacco, sugar, and stone.

1. Although Virginia no longer is the largest producer of tobacco (cf p 114), it is still much the largest manufacturer. Richmond, a convenient centre for the three famous 'tobacco valleys' of the James, the Roanoke, and the Rappahannock,—with the additional advantage of being at the head of tidal water on the James—exports about three-fifths of the whole amount of manufactured tobacco; but Petersburg, Lynchburg, and Durham (N C), are also important. Cigars are manufactured all over the country, but the best are made in the humid air of Key West.
2. The largest sugar-refineries are at New Orleans, which commands the local cane plantations of Louisiana; but all the large ports near coal have busy refineries. San Francisco specialises in beet-sugar (as well as cane—from Hawaii), and Ogden and Salt Lake City have special advantages also for beet-sugar industries, because the excess of alkali in the soil which is so prejudicial to other crops, is favourable to the sugar-beet.
3. Limestone is very common, and is quarried for all sorts of purposes, especially for building purposes, a flux in smelting, and the making of lime and cement (*eg* at Rondout, N.Y.). But, simply as stone, it is not as important as the marble of Vermont (especially at Rutland), the granite of New Hampshire ('The Granite State'), and the sandstone of Connecticut and New Jersey (especially near Belleville). Cf Cape Ann granite.

*NB*—The famous 'Lehigh' slate comes from near Allentown (Penn.), cf. the slate of Castleton (Verm.) and Middle Granville (N Y)

21. Seven cities may be taken as typical of three great areas—the eastern seaboard, the western seaboard, and the midlands.

1. The great commercial metropolis of New York occupies an ideal site for a great harbour on Manhattan Island, with the Hudson River on the west and the so-called 'East River' arm of Long Island Sound on the east,—Long Island itself protecting the approach from the ocean. It is practically free from ice, conveniently situated for European trade, and within easy reach of fuel and machinery, and it has splendid communication inland, mainly *via* the Hudson

river and canal system. Indeed, the facilities for transport by rail and by water up the Hudson and the Mohawk valleys have attracted to New York a large proportion of the export trade even from the Far West.

It is now well above London in the matter of tonnage entering and clearing, and transacts nearly half the foreign trade of the country, but, as its insular position has prevented its natural expansion, it has spread its total population of 5,000,000 over its immediate neighbourhood, including the 'cross-water' suburbs of Brooklyn, Long Island City, and Jersey City. Consequently its great local industry is clothing (cf Bridgeport sewing-machines).

*N B*—Brooklyn is now formally incorporated in New York.

2. Boston occupies a group of peninsulas on the tidal estuary of the Charles River, and has a perfectly safe and commodious harbour; but it is some distance from coal and iron.

The great water-power and vast forests of New England have led to a wide development of textile, leather, and paper industries, though the climate is not altogether suitable for textiles (cf p 15); and Boston imports large quantities of cotton, wool, and hides, for distribution to river-side towns like Lowell, Lawrence, and Haverhill, and collects their manufactures for export. It has also developed large clothing and book industries of its own; and its neighbour, Lynn, has developed a large boot and shoe industry.

Of course, paper is even more important than leather in the book trade, and Holyoke, which stands on the Connecticut at the foot of the forest-clad Hoosac Mountains, makes more paper than any other town in America.

As the chief harbour on the New England coast, Boston has attracted all the great western railways; and thus it has special facilities for distributing goods, *eg* the fish of Gloucester, the largest fishing-port in the country.

3. Philadelphia stands where the confluence of the Delaware and the Schuylkill make the head of ocean navigation, but the amount of land round the estuary, and the exposure to the northern winds, sometimes cause it to be partially frozen in winter. Its importance is due, therefore, less to its harbour than to the field of magnificent anthracite coal which lies along the Schuylkill, and which has made the city the greatest manufacturing and brewing centre in the New World. It has very good communication inland up the valley of the Susquehanna, which in its lower course breaks right across the Alleghanies; and this makes it the natural outlet eastward for the great coal, iron, and oil fields of Pennsylvania. Cf. Harrisburg and Reading.

Pennsylvania is one of the best sheep-raising districts in the country, and has large forests of hemlock-spruce in the north; and Philadelphia is also the natural outlet for the wool, skins, and tanning bark. This gave rise to the carpet and leather industries for which the city is now so famous. The fine sheltered harbour, the abundance of coal and iron, and the nearness of good timber, have also made it the greatest shipbuilding centre in the country.

*N.B.*—It was the most southerly Atlantic port in the Anti-slave States, and is now the commanding centre of the three great natural gaps across the eastern highlands—the Mohawk, Delaware, and Potomac valleys.

4. Chicago is "the epitome and climax of lake and prairie." It is one of the most perfectly equipped ports in the world, and has been deepened to admit vessels carrying up to 5000 tons of cargo. More vessels enter and clear every year than at London and New York combined! And by the Illinois river and canal system it has direct water communication with St. Louis, *i.e.* with the Gulf of Mexico, through the richest maize area in the country.

All the trans-continental railways of the north must converge on it to get round Lake Michigan, and the level expanse of prairie gives every facility for railway construction. It has the rich coalfields of Indiana and Illinois behind it, and is within easy reach by water of the iron, copper and timber of Michigan. Consequently, it is the greatest railway centre, the greatest grain market, the greatest pork market, and one of the greatest lumber and cattle markets in the New World.

*N.B.*—Its 'meat' trade has scarcely recovered from the effects of the recent scandal, but the city is still the chief meat 'forwarder'.

The presence of a huge population in the centre of a timber area has given rise to an enormous furniture industry, and the demand for railway stock and agricultural implements is at least equally great. Naturally, too, in a cattle and timber market, there is an important leather industry. As a great railway junction so near the Michigan ore, it has also developed very large iron and steel works—specialising in rails and locomotives; cf. the Pullman works.

5. St. Louis is the centre of a huge area of very rich country, being half-way between the Rockies and the Atlantic, and half-way between Lake Superior and the Gulf of Mexico. This gives it exceptional advantages for collecting and distributing goods. The level of the land, and the fact that for many years St. Louis was the lowest point at which the

Mississippi was bridged, made it a great railway centre; and these southern railways are never blocked by snow. Being just below the confluence of the Missouri and the Mississippi, it has also special advantages for river shipping. With a rich grain area to the north-west and a rich tobacco area to the south-east, it specialises in flour-milling and manufacturing tobacco. Cf Louisville and Frankfort (also famous for barrels, whisky, and leather).

6. Kansas City stands to the west of the great maize area, the east of the great cattle area, and the north of the cotton area of the country. It is a very important railway junction, and the downhill grade enables very heavy trains to be run to the Gulf ports. The climate is very healthy, the death-rate being only 11.50 per 1000; and the dry air and the abundance of grain make it one of the greatest egg markets in the world, with a production of about *twenty-one and a half million dozen* per year. Being just between cattle and cotton areas, it makes large quantities of oil-cake

*NB*—Of course, it ought to have excellent navigation up and down the Missouri, but it stands just where the Kansas and the Missouri drop on to the 'bottom' lands, and therefore choke the waterway with mud.

7. San Francisco occupies a peninsula on the south, *i.e.* the sheltered, side of the Golden Gate, where it has a delightful climate and every facility for commerce except coal. All the railways from north, east, and south must converge on the Golden Gate to reach the Pacific; and the harbour has immense wealth behind it in wheat, fruit, and wool, and to a less degree in precious metals. It also practically monopolises the growing U.S.A. trade with China and Japan. It is the only natural harbour between Astoria and San Diego! But its position on a line of relative weakness of the earth's crust (*cf* p 154) renders it liable to volcanic and seismic disturbances

22. The war has enabled the U.S.A. to make great inroads on British trade, especially in Europe, Latin America, and the Far East.

1. Nearly £700,000,000 was spent on the 'emergency fleet,' and 13,000,000 tons were added to the available shipping (exclusive of the 700,000 tons of confiscated alien shipping), thus quite obviating the old need for paying £60,000,000 a year to foreigners for sea-carriage
2. The output of coal, both aggregate and *per cap.* of the miners has been greatly raised, and the export has risen enormously, while our export has almost come to a standstill.



## Mexico.

1. THERE are marked differences between the two coasts, which will be emphasised by the canal

1. The west coast is more than twice as long as the east, and half of it is outside the Tropics, it is high and rocky, with one or two really fine bays, while the east is low and fringed with sand-banks, and has not a single natural harbour; it is exposed and comparatively healthy, while the east is shut in and awfully unhealthy. Indeed, the only advantages of the east coast are that it has easier access inland, and is nearer to large markets
2. Vera Cruz, in the centre of the Gulf coast, has behind it the densest population of the country, including the cities of Mexico and Puebla, but its climate is terrible. In fact, it is simply a filthy, fever-haunted gateway to the plateau. Tampico is in a rich agricultural district with very valuable minerals behind it, and—for Mexico—it has easy communication inland by rail to St. Luis Potosi, the great railway junction on the eastern edge of the plateau. It is therefore becoming more important than Vera Cruz

*N.B.*—The railway from Vera Cruz to Mexico ascends 8000 feet in 80 miles!

3. Acapulco is a fine natural harbour, but its commercial importance is greatly injured by the extremely difficult communication inland. Mazatlan owes its importance partly to the fertility of the lowlands behind and to the north of it, and partly to its command of the Gulf of California. San Blas and Manzanilla, when connected with Mexico by rail, will become termini of trans-continental routes; and Guaymas has easy access by rail into the United States, the junction with the Southern Pacific Railway being at Nogales, and Ciudad Juarez and Porfirio Diaz.

*N.B.*—The Gulf of California contains pearl-oysters.

4. Carmen and Campeachy export the cabinet and dye woods of Yucatan, and Progreso and Sisal export the henequen of Merida ('Sisal' hemp). The terminal ports of the Tehuantepec railway—Coatzacoalcos and Salina Cruz—are becoming very important in trans-continental traffic.

2. The mass of Mexico is a high triangular plateau shut in by a low strip of narrow plain along each coast.

1. As the plain along each coast is divided from the plateau by a mountain chain, the Sierra Madre 'Oriental' and 'Occidental,' and as the plateau sinks and broadens from the great peaks of Popocatepetl and Orizaba down to the valley of the Rio Grande, the longest rivers must flow northwards, and will probably empty into lakes, fresh or salt.

*N.B.*—The heat and the height cause such rapid evaporation that the temporary lakes of the rainy season are soon converted into salt marshes.

2. South of the highest peaks lies the lowest depression, the Tehuantepec Isthmus, the peninsula of Lower California is a barren 'sierra,' and that of Yucatan a forest-clad plateau.
3. The low level, great heat, and heavy rainfall make the coast strip very fertile, but terribly unhealthy; and, therefore, nearly the whole population lives on the plateau, where the mountains run parallel to the coast, and so prevent wet winds from penetrating inland. The dry climate is very healthy, but necessitates irrigation for successful agriculture.
4. Though so large a proportion of the plateau is in the Tropics, its great average height materially modifies the heat—which is also made more bearable by the dryness. Indeed, in the north, the latitude (cf p 7), the distance of the interior from the sea, the presence of mountains parallel to the coasts, and the absence of mountains along the U.S.A. border, cause great drought and extremes of climate similar to those of Arizona and New Mexico.
5. The intense heat of the great basin of California ('Hot Furnace') causes a monsoon wind in summer; and therefore, except in the far north, there are only two seasons—wet (May to November) and dry.

*N.B.*—The Mexicans themselves call the low unhealthy area *tierra caliente*, the general plateau *tierra templada*, and the region above 7000 feet *tierra fria*—i.e. 'hot,' 'temperate,' and 'cool' lands

3 As the soil is largely volcanic, it is very fertile.

1. The 'hot lands' are covered with forests—of mahogany, logwood, rosewood, ebony, etc, and produce all sorts of tropical vegetation, especially here:quen.
2. The 'temperate lands' are covered with various species of cactus, on some of which the cochineal insect feeds, and produce maize, beans, agave, and tobacco (Anahuac).

*N.B.*—Maize and beans are the chief food, and agave makes 'pulque,' the national drink. Irrigation is very important.

3. The 'cool lands' produce wheat and barley, and have splendid natural pastures for cattle and sturdy little horses.
4. The tropical vegetation includes also coffee, cotton, cacao, sugar, bananas, vanilla, rubber, and jalap.
  1. The coffee and bananas are grown on the forest-clad seaward slopes of the mountains, the cacao and vanilla on the sheltered strips of volcanic plain, and the sugar (and tobacco) on the parts of the exposed coastal lowlands that are rich in lime, *e.g.* the Vera Cruz district (also famous for vanilla).
  2. Henequen and cotton are grown mainly round the Gulf of Campeachy, the former in Yucatan and the latter where the water-power for manufacturing is greatest—behind Vera Cruz. The more important for export is the henequen, which is both cheaper and stronger than jute, and the best qualities are grown between Acapulco and Oaxaca.
  3. The rubber grows best on the isthmus of Tehuantepec, and the jalap on the mountains round Xalapa—from which place, indeed, the drug takes its name.
5. The mineral wealth is very great, especially in silver—found with lead—iron, copper, and sulphur.
  1. Silver mines stretch almost continuously along the western edge of the plateau from Oaxaca to the U S A frontier; but the richest deposits have been found round Guanajuato, Zacatecas, and San Luis Potosi.

*N.B.*—Gold is found (with mercury) in the Yaqui basin and behind Acapulco

  2. The iron, which is of superb quality, is found in enormous quantities on the slopes of the Sierra Madre, especially round Jimenez and Durango Cf. Culiacan
  3. The sulphur is found pure in the crater of Mount Popocatepetl, and the export of it is a special industry in Puebla.
  4. Coal is found on both the northern edges of the plateau—in the east where the International Railway to San Antonio, U S.A., crosses the Sabinas River, and in the west behind the harbour of Guaymas in the valley of the Rio Yaqui; it is also found behind Manzanillo, but is of poor quality.
  5. Petroleum is rapidly becoming a very important product, already representing 4 p.c. of the world's output—from Tampico, Coatzacoalcos, Tuxpan, etc.
6. Industries, as in the rest of Latin America, have made little progress, mainly owing to political causes.

1. The great railway centres of Mexico City (halfway between the Atlantic and Pacific coasts) and Puebla share almost all the industries of the country. They manufacture tobacco and cigars, like Oaxaca and Zacatecas—leather (especially saddlery) like Leon and S. Luis Potosi—and porcelain, like Guadalajara and Zacatecas.
2. Coarse cottons and woollens are made at Durango, Guadalajara, Aguascalientes, and Puebla, Durango and the great grain centre of Chilpancingo have distilleries; Tuxpan refines the local petroleum, and prepares vanilla; Cordoba is the centre of the coffee industry; and Oaxaca is very famous for its chocolate, Puebla for its 'onyx,' and Queretaro for its opal industry.

*NB*—The inter-oceanic Tehuantepec railway, which has greatly developed Mexican trade, is still a serious rival to the Panama canal.

- 3 The extraordinary mineral wealth of the country is still scarcely touched, especially the iron, but there are important metal works in San Luis Potosi, Monterey, Durango, and Aguascalientes—not one of them, however, in the state of Hidalgo, in which the most valuable mines are worked at present.

## Central America.

1. ALL the States of Central America, except British Honduras, are more or less caricatures of the United States, and produce little except raw materials.

1. The land is subject to all the vast, terrible, and unreliable phenomena characteristic of mountainous areas near tropical seas—*e.g.* earthquakes, volcanic eruptions, sudden thunderstorms, etc.; and revolutions are almost as common as earthquakes,—the political disquiet of the people being the counterpart of the physical disquiet of their land.

*N.B.*—Earthquakes are caused by a change in the weight of the earth's crust, and this itself is caused mainly by the removal of masses of soil from mountain tops to the ocean floor. Contrast the freedom from earthquakes on low inland plains in temperate latitudes, *e.g.* Russia or Canada.

2. As in Mexico, the climate and the character of the coast make the west more important than the east.

1. Though the best harbours are therefore on the Pacific, the inferior harbours, which face the markets of Europe and U.S.A., have had hitherto most trade.

3. The surface is generally a rough high plateau, bordered along the Pacific coast by parallel ranges of mountains and along the Gulf of Mexico by a broad low swampy plain

1. Many of the mountains are volcanic, which accounts for their rapid 'weathering,' and thus for the richness of the lowland soil. Their great height, their direction, and their nearness to the sea cause a very heavy rainfall, which materially hastens the 'weathering' and removes the 'weathered' soil, and, therefore, the rivers, though not long, have a great and constant volume. The longest is the San Juan; the Montagua is navigable, at high water, for 100 miles.
2. The deep depression across the south of Nicaragua has accumulated enough water to form the large but shallow lakes of Nicaragua (115 miles long by 45 miles broad) and Managua (35 by 20). Cf. p. 22.

4. The intense heat and heavy rainfall make the climate very unhealthy except on the higher levels, but also make the rich volcanic soil produce most luxuriant vegetation.

1. Forests of valuable cabinet and dye woods—such as mahogany, rosewood, logwood, and fustic—cover almost the whole area, and are mainly responsible for the appalling abundance of offensive insects
2. The forest-clad seaward slopes of the lower ranges form an excellent site for coffee trees. Costa Rica is even called 'the Coffee Republic,' and the product of Guatemala (especially round Coban), San Salvador (round Santa Ana), and Nicaragua (round Leon, Granada, and Managua) is very good. The low coast plains offer an equally good site for sugar-cane, and the sheltered volcanic valleys for cacao.
3. The high western plateau supplies magnificent pasture for cattle and even sheep, which accounts for the large export of cattle and hides and for the local leather and woollen (*e.g.* at Quesaltenango) industries
4. Bananas, maize, and black-beans (the food of the people) are grown nearly everywhere; good tobacco comes from the eastern lowlands of Honduras, and the best indigo in the world from the lowlands of Salvador.

5. The mineral wealth is probably very great, and is known to include silver, gold, and zinc; but it is quite undeveloped.

1. The mines nearest to navigable water, and therefore the most worked hitherto, are the gold mines of the Mosquito Reserve, just behind Blewfields, but the richest seem to be the silver mines of Honduras

6 Guatemala is mainly one high plateau, and therefore has a comparatively healthy climate; and, as it has also access to both seas, it is the most important State.

1. On the Pacific, the roadsteads of San José and Champerico have railway communication respectively with New Guatemala and Quesaltenango; and the Gulf ports of Puerto Barrios and Livingston have easy access up the Montagua valley to New Guatemala, which is sufficiently high and sufficiently sheltered from the wet Trade winds to be

healthy (cf. the cochineal trade), and has thus become the largest town in Central America, and an important inter-oceanic junction.

*N.B.*—Old Guatemala was just at the foot of two volcanoes, but was destroyed so often that the capital had to be moved out on to the plateau.

7. Salvador consists of a very narrow coastal plain backed by a rough volcanic plateau.

1. This coast plain, especially round Libertad, grows the famous 'Balsam of Peru,' as well as sugar and indigo. The ports of Acajutla and Libertad are connected by rail with San Salvador, the political and commercial capital, and Acajutla is also connected with the coffee centre of Santa Ana. La Unión, a still better harbour, is to be connected with San Miguel, it exports vanilla and cochineal.

*N.B.*—San Salvador was shaken to pieces so often that its site was changed, but the new site is no better.

8. As Honduras slopes almost entirely to the Atlantic, it is very unhealthy.

1. There are magnificent cattle pastures on the uplands, especially round Comayagua, forests of mahogany and rubber along the Truxillo coast, and tobacco plantations round the Cartago Lagoon. Sarsaparilla and the coconuts of the Bay Islands (exported from Cortez and Ceiba) are special products, and bananas are becoming important.
2. The mineral wealth is considerable, and includes rich deposits of silver between Tegucigalpa and Amapala and gold in the Patuca valley, *e.g.* at Juticalpa, but it is waiting for transport. Puerto Cortez is the chief harbour, La Ceiba, Truxillo, Amapala, San Lorenzo, etc., are all small.

9. British Honduras is mainly a timber state.

1. The coast is fringed with coral 'keys,' amongst which turtles are very abundant; and the lowlands produce henequen, sugar, and very large quantities of fruit, especially bananas.
2. The forests supply mainly longwood and mahogany, the timber being cut in the dry season and floated down the rivers in the wet season, and the export depends on the height of the flood, especially on the Belize.
3. The forest supplies also coffee, india-rubber, and rosewood.

*N.B.*—The effect of the marshes rather spoils the quality of the mahogany.

10. The advantages of Nicaragua in its area, large coast, varied surface, and great natural wealth have been

neutralised by its political disquiet, and the difficulty of communication across the inter-oceanic water-parting.

- 1 The San Juan river provides a fair harbour in Greytown (now a free port), and the Gulf of Fonseca and the bay of Salinas are natural harbours, but they are so far from populous centres that most of the traffic is done by Corinto, which has communication by rail up to Lake Nicaragua
- 2 The climate is naturally very even and very unhealthy except in the great western depression, which is sheltered from the Trade winds by the mountains. Consequently, all the important towns—Managua, Granada, Chinandega, Rivas, and Masaya—are in the west

*N.B.*—The old capital was León, which is a larger town, but it was so often shaken to pieces that it had to be abandoned in favour of Managua.

- 3 The eastern plains support a very large number of cattle; there are dense forests in the centre, especially of fustic, and the rich western valleys raise almost every kind of tropical and semi-tropical vegetation, especially coffee and bananas. The forests produce quantities of drugs, and there are hammock, straw-hat, rubber, and tobacco industries. Coffee is much the most important export

**11.** In Costa Rica the climate is naturally very moist and mild, and the volcanic soil is extremely fertile.

- 1 Coffee and bananas are the chief agricultural exports, cattle-rearing is an important industry, the forests supply cedar, fustic, and rubber, and the shore waters supply tortoise-shell
- 2 The mineral wealth is at last being worked, and is mainly in gold and silver, and the La Trinidad mines are proving so productive that they are beginning to justify the country's title of 'The Rich Coast.'
- 3 The capital, San José, stands on the west—the dry and healthy—side of the mountains, but it has railway connection with the Gulf port of Limon *via* Cartago as well as with the Pacific port of Punta Arenas *via* Alajuela, and nearly all the bananas are exported from Limon

**12.** Panama, the size of Ireland, is exceedingly fertile as well as strategically and commercially important.

1. The canal is now working quite satisfactorily.
2. The special products are bananas, rubber, coffee, and cacao.



### The West Indies.

1. EXCEPT in the Bahamas, practically all the islands are mountainous, with low fertile coastlands, and have a tropical climate.

1. There are two seasons, the wet and the dry; the wet season lasts from May to December, and the dry season from December to May. And the tropical heat is greatly modified by the daily sea-breezes, the Trade winds, and the considerable elevation.
2. If, in addition to the great heat and great moisture, there is also calm air for any length of time, the three conditions are present which give birth to hurricanes; and this often does occur in August and September, when the heat and the moisture are greatest
3. The force of the Trade winds has caused all the windward coasts to be clogged with driven sand, so that all the good harbours are on the leeward side, and the leeward parts of the islands are also much the drier (cf the presence of croton and cactus), and therefore the healthier, especially in summer, and contain all the important towns

*N.B.*—The most exposed islands are, naturally, the healthiest, *e.g.* Barbados, Antigua, and Dominica—the last being also very high, with a very porous soil.

4. The coral formation of the Bahamas is covered with only a thin layer of sandy loam; but the soil elsewhere is largely volcanic, and therefore needs only heat and moisture to make it produce enormous crops. In most of the islands there is also an immense natural supply of potash manure in the soil, in the form of vegetable refuse. and some of them, *e.g.* Sombrero, Redonda, and St. Martin, are rich in phosphates of lime
5. The position of the islands puts even the smallest of them within fairly easy reach of regular steamer-routes.

*N.B.*—The salt sea-breezes are favourable to the great staple—sugar.

2. With such a soil and climate, vegetation is very luxuriant, and includes almost all tropical plants.

1. Sugar has hitherto been the great staple, but the industry has been greatly injured by unscientific culture,—by the incurable laziness of the emancipated negroes, and the ease with which in all the islands they can grow maize—and by the competition of ‘bounty-fed’ beet-sugar, especially from Germany and France. Cuba produces much more cane-sugar than any other country in the world—Java coming second, and Jamaica, Trinidad, and Barbados also produce considerable quantities.

*N.B.*—The amount of rum that can be made from 1 cwt of sugar varies with the humidity of the climate and the season

2. Tobacco has ranked next to sugar in the past, but is becoming of relatively less importance. The best cigar-leaf in the world has hitherto been grown in the Vuelta-abajo district, and Havana has thus become very famous for the manufacture of cigars. Tobacco is also grown in some of the other islands, *e.g.* Tobago, Trinidad, and Puerto Rico, and there is no reason why it should not be grown widely wherever the soil suits, *i.e.* on any forested coral formation, where it can get lime and vegetable soil.
3. In recent times coffee has become the greatest rival of the sugar and tobacco. As the plant is grown so largely for export, the plantations should be as near the sea as possible—*e.g.* on a small mountainous island. Thus, Kingston stands below the leeward side of the forest-clad Blue Mountains, and Jamaica is the most sheltered of all the West Indian islands from the Trade winds.
4. Cacao has also become a very important product in recent times. The plant has been found growing wild in Jamaica and Martinique—the best proof that both soil and climate are favourable; and the cacao of Trinidad and Grenada actually ranks next to that of Venezuela in the market. Like the coffee, it is grown almost entirely for export, which is an additional reason for its being grown near the sea; but it is an entirely lowland plant, and can flourish in a drier climate than the coffee—*e.g.* in Dominica and Grenada.

*N.B.*—The chief crop is gathered at Christmas, and a subordinate crop at Easter,—both, therefore, being gathered during the dry season.

5. Other characteristic products are—such fruits as the orange (Jamaica, Bahamas, Dominica), lime (Montserrat, Dominica, Jamaica), banana (Jamaica, Martinique, Cuba), pine-apple (Bahamas, Antigua, Jamaica), and coconut (Trinidad, Jamaica, Caymans)—such spices as the pimento, or ‘all-spice’ (cf. Dominica ‘bay-rum’) and ginger of Jamaica—and

such tubers as the cassava, or 'tapioca,' of Dominica, Martinique, and Guadeloupe, and the arrowroot of Tobago. Haiti and Cuba produce the best mahogany, and Cuba produces the best fustic in the world.

*N B* — Before the recent eruptions St. Vincent was noted for arrowroot.

3 Cuba consists of a long low range of hills flanked by level plains rising to the lofty Sierra Mæstra

1. The coast is fringed with lagoons, but has several good harbours, *e.g.* Havana, Matanzas, and Santiago; even where it is otherwise useless, there are valuable sponge and oyster fisheries, the sponges being used in damping tobacco, and the coast-lands produce quantities of bananas and coconuts. Cf the oranges
2. The mountains are covered with timber, including fustic, mahogany, and 'cedar' (for cigar-boxes); and they contain manganese, iron, and copper, the iron of Daiquiri being very fine. Most mines are in the Santiago district.
3. The rivers, which flow northward and southward from this central watershed, are too short to be useful for navigation; but they supply excellent drinking-water, and are very valuable for irrigating the plantations of tobacco in the west, sugar throughout the whole central area, and cacao in the east. Between the sugar and the cacao there are splendid cattle pastures, the 'royal' palm is common, and the forested seaward face of the Sierra Mæstra grows good coffee
4. Havana has, as its name implies, a magnificent *haven*, and, as the most westward harbour of the West Indies, practically commands both the Yucatan and the Bahama entrance to the Gulf of Mexico. It is the natural centre for the tobacco and sugar industries of the fertile western plains, over which there is a network of railways radiating from the capital.
5. Santiago ships the iron and coffee, and Manzanillo the cedar and mahogany, of the Sierra Mæstra. Cienfuegos and Trinidad ship tobacco and sugar, Puerto Principe is an important railway terminus and cattle-market, and Gibara and Baracoa ship fruit (Cf *Isla de Pinos*)

4 No advantage has been taken of either the very favourable position of Haiti for commerce or the extreme fertility of its soil.

1. As the island lies between the two main entrances to the Caribbean Sea, it has exceptional advantages for commerce,

especially through the Haitian harbours of Port au Prince, Cape Haitien, and Cayes, and the Dominican ports of Puerto Plata and S. Domingo.

2. *Haiti* means 'high hills,' and the surface is very hilly. The forest-clad mountains of the west produce so much coffee that the Haiti Republic sometimes stands next to Brazil and Java in the export of coffee. The special products of the Dominican Republic are tobacco from the northern plains, especially round Santiago and La Vega, and sugar from the southern plains, especially round the town of San Domingo. Cotton and pita 'hemp' are also important.
3. The other products of the island include tanning and dyeing materials from the Divi-Divi shrub, cacao, logwood, and the best mahogany in the world.

*N.B.*—The splendid bay of Samana has now been connected by rail with La Vega and Santiago, and must attract the mass of the trade in future.

5. Jamaica has a line of forest-clad mountains running throughout its entire length, from which innumerable streams flow northward and southward across low coastal plains

1. On these plains a fair quantity of sugar is raised, and Jamaica rum is still said to be the best in the world. The coffee of the Blue Mountains has a similarly high reputation, and there is also a very important fruit industry—mainly in oranges and bananas. Cf the vegetables

*N.B.*—About 45 per cent of the exports are fruit Cf p 163, § 10.

2. Amongst the other products are pimento, ginger, salt, phosphates of lime, guano, and turtles from the dependent islands—the salt mainly from the Turks and Caicos islands, the phosphates and the turtles mainly from the Caymans, and the guano from Morant and Pedro Cays.
3. Kingston, the political and commercial capital, stands immediately under the lee of the Blue Mountains, with their immense vegetable wealth; it has a fine harbour on the land-locked bay of Port Royal, and it is the terminus of the double railway system which runs through the plantations of the interior. The old capital of Spanish Town is an important railway junction between Kingston and the two ends of the island—Port Antonio and Montego

6. Puerto Rico, the most exposed of the greater Antilles, is also naturally the healthiest.

1. Like the three larger islands, it consists of a range of mountains running from east to west, flanked by strips of low plain, which are covered with the rich volcanic and limestone 'weatherings' of the highlands.
  2. This plain produces sugar, especially between Arecibo and San Juan, and tobacco, especially between Ponce and Guayama, with coconuts along the shore, the mountains produce excellent coffee, which is much the most important export (e.g. from Mayaguez and Aguadilla); and the intermediate slopes are largely used as cattle pastures.
  3. With abundance of salt (evaporated on S coast), tallow (from cattle districts), and coconuts (for oil), soap-making is the most typical industry, both in inland towns like Ponce and San German, and in the chief ports of San Juan and Playa.
7. The special industries of the Bahamas are in sponges and fruit.
1. As they are of low coral formation, thinly covered with a good sandy loam, and lie directly in the path of the Gulf Stream, the innumerable reefs, with their warm lagoons, are the site of important turtle and pearl fisheries as well as the sponge, and of salt, guano, and ambergris industries.
  2. The larger islands produce very large quantities of fruit and fibre, especially pine-apples, grape-fruit, and oranges, henequen and agave. Eleuthera is the chief fruit island; Andros produces mainly the juniper or pencil-cedar.
  3. Nassau, the capital, is a favourite winter resort for invalids, and has a 'tortoise-shell' industry in connection with the turtle fishery.
8. The Windward Islands proper consist mainly of a series of extinct volcanoes shooting up through coral reefs, and therefore they have a peculiarly fertile soil.
1. The Gulf of Paria gives Trinidad a splendid natural harbour, and supplies the deficiencies of the two sheltered roadsteads of San Fernando and Port of Spain, while the exposed coral beach on the east produces millions of coconuts. The soil is very fertile, and produces sugar and tobacco—the former in enormous quantities—on the sheltered western plain, and coffee and cacao on the forest-clad hills.
- N.B.*—The asphalt lake of La Brea is in the extreme south-west.
2. The very fertile soil of Guadaloupe can produce all tropical products, including manioc, sweet potatoes, and bananas;

but the special products are sugar, coffee, and dyes (anatto and logwood), and the remarkably damp climate encourages a large rum industry.

3. Dominica and St. Lucia are thickly forested, and grow all the typical West Indian products; but St. Lucia exports mainly sugar, cacao, logwood from Port Castries, while Dominica exports mainly lime-juice and coffee. St. Lucia has a particular 'crystalline' species of sugar-cane, which seems able to resist all climatic and insect-plagues
4. As Barbados is the most easterly of the islands, it has a specially breezy and healthy climate, though subject to hurricanes; and, as the whole island is flat and low, it is simply covered with sugar plantations. (Cf the famous 'Muscovado' sugar). Cotton is also important now.

*N.B.*—Bridgetown is a poor harbour,

5. The barren St. Thomas has such a central position and such a fine harbour that it has become a great cable and steamer centre, though, like the rest of the Virgin Islands, it is subject to hurricanes and earthquakes

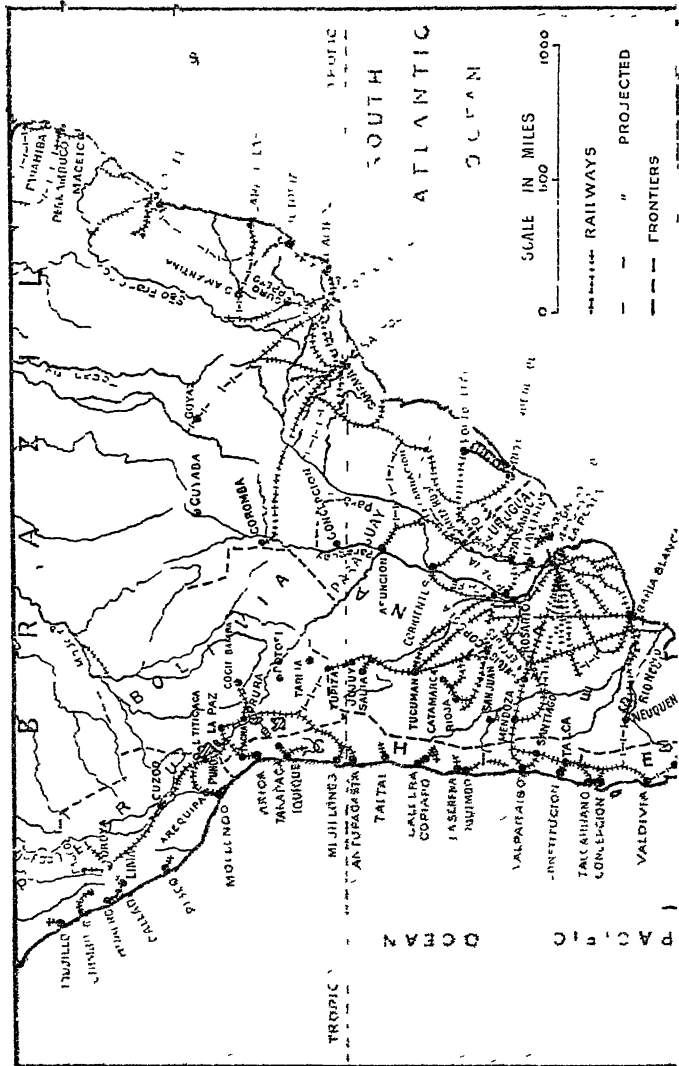
9. The Leeward Islands proper stretch along the north coast of Venezuela.

1. The most important is Curaçao, a hilly waste on which the kind of bitter orange is grown that is used in the manufacture of the real Curaçao liqueur; but the chief product of the group is salt, especially from Oruba and Buen Ayre.

*N.B.*—Willemstadt manufactures liqueur, and is an important outpost for Dutch trade with Venezuela and Colombia

10. All the Imperial units in the West Indies are in a condition of almost absolute economic slavery to gigantic U.S.A. 'Trusts.'

1. The United Fruit Company has a complete monopoly of the whole 'Carib' banana industry, strangling both the producer and the consumer, especially in Jamaica since the collapse of the subsidised service to Bristol.
2. Union with Canada (cf. p. 132) would rescue both producer and consumer from this slavery, would give enormous impulse to the production of fruit, sugar (now only 300,000 tons!), and various vegetable oils, as well as providing cheap transport, and the protection of the Canadian law against "unfair competition."



## SOUTH AMERICA.

1. SOUTH AMERICA has a comparatively small proportion of coast ; but it has much more benefit from its surroundings, both commercially and climatically, than the similarly compact continent of Africa.

1. The chief openings in the coast are the mouths of great 'Atlantic' rivers that are navigable far into the interior ; and between these there are isolated bits of mountainous coast which provide splendid harbours. Thus, the remains of a huge mountain mass shut in the harbour of Rio de Janeiro between the Amazon and the Plate.
2. Elsewhere, especially in the hottest latitudes, the country is entirely exposed to the full influence of sea winds, including both the S.E. and the N.E. Trades. For instance, the coast-line of the Orinoco and Amazon deltas and the country between them is an absolutely flat mangrove-swamp ; the whole of the 'elbow' of Brazil is bordered only by a sandstone reef ; the 'temperate' coast north of the Plate estuary is a series of lagoons.
3. The west coast, north of the useless fiord-system, is steep and almost unbroken ; but the close proximity of the mountains makes it much more healthy than the east, and their bold headlands shelter a few small but safe bays.

*N.B.*—This helps to account for the fact that the Spaniards—who conquered from the west, fared better than the Portuguese—who conquered from the east

2. The typical surface features are three mountain-systems,—those of the Andes, Brazil, and Guiana—giving birth to three river-systems,—Amazon, Plate, and Orinoco—spread over three plain-systems,—the Selvas, Pampa, and Llanos.



1. The characteristic feature of the continent is the very large proportion (nearly half) of it that is less than 600 feet above the sea, compared with the relatively large proportion that is more than 10,000 feet
2. Although not reaching such an extreme height as the Himalayas, the Andes are more uniformly high, more unbroken, and three times as long—nearly 5000 miles. From Cape Horn they run for about 2000 miles in a comparatively simple, single line, up to the great westward curve of the coast; from this point they become a double chain, surrounding the Titicaca lake plain; and northward, again, they become a treble chain. Throughout their entire course they rise above the line of perpetual snow in the different latitudes; they contain a great number of active volcanoes, and are the scene of almost hourly earthquakes.
3. The Eastern Highlands consist of extremely old rock, which—long before the Andes existed at all—had been ‘faulted’ into masses of table-shaped mountains; and now, owing to the erosion of running water, they have been divided up into wide river valleys. Owing to the general slope of the plateau, all the longest rivers, except the São Francisco, flow inland as tributaries to the Amazon or the Plate; but none of them, except the Madeira, are of much use for navigation, being spoilt by rapids where they tumble over the edge of the plateau

### 3 The Central Lowlands may be divided into two areas—Patagonia and the Great River Basins.

1. The Llanos are ‘savannas,’ *i.e.* a link between the rainless deserts into which steppes gradually pass, and the tropical forests which are fed by a constant equatorial rainfall; and their long dry season limits their vegetation to plants which can grow and ripen during the short wet season, *i.e.* grasses.
2. The Pampa are of the savanna type, but in temperate latitudes; and they are only dry enough to be treeless, showing their fertility during the dry season in gigantic crops of thistles—always a sign of rich soil. Cf. New Zealand.
3. The Selvas are forest-plains under equatorial heat and rainfall—a huge stretch of dense, dark, damp jungle, under the deep shadow of which the natives are overwhelmed physically and morally.
4. Owing to the general low level of the continent, the river-system is unique.

1. There is always communication by water between the Orinoco and the Amazon *via* the Cassiquiare and Rio Negro, and in the wet season there is similar communication between the Amazon and the Plate *via* the Madeira and the Paraguay.
2. Though not the longest river in the world, the Amazon has the largest basin and the greatest volume. Its basin is nearly as large as Canada, and provides at least 25,000 miles of navigable waterway in the 1000 miles to the ocean from the confluence of the Marañon—or Upper Amazon—with the Ucayali at Nauta, it falls less than 400 feet, and there is no insurmountable obstacle below the Jaen rapids; and the tide is felt certainly as far as Obidos (400 miles).
3. The La Plata system has a greater volume than any other river in the world except the Amazon and the Congo, and is very useful to both commerce and agriculture. Unlike the Marañon, however, which rises at a height of over 14,000 feet and falls 10,000 feet in about 100 miles, the Rio Grande, or Upper Parana, rises in the low rain-fed forests behind Rio de Janeiro; but its course over the gentler slope of the Brazil plateau, like the course of its chief tributaries—the Paraguay and the Uruguay—is much interrupted with rapids.

*N B*—Note the number of river-side towns called *Salto* ('jump').

4. The Orinoco is navigable for at least 1000 miles, but is subject to heavy floods; it has formed a large unhealthy delta, and is subject to tidal-bores.
5. As the surface of the continent is comparatively uniform, the climate shows similar uniformity; and the two determining elements are height and wind.
  1. The Andes divide the continent into two areas—a comparatively small Pacific area, dependent for regular rain on west winds, and a much larger Atlantic area, similarly dependent on east winds. And the Tropic further divides it into two areas—a Tropical area, two-thirds of the whole, and a Temperate, but the surface of the Tropical area is greatly protected from the sun by dense forest.
  2. Consequently, in the east an immense amount of rain is brought to the Tropical area by both the Trade winds; but there are areas of drought outside the Trade-wind influence, e.g. the Shingle Desert. In the west a considerable amount of rain is brought to the Temperate area by the Anti-

Trades, though there are areas of drought outside the influence of the Anti-Trades, *e.g.* the Desert of Atacama.

*N.B.*—There are also areas of drought on the plateau *between* the various Andean ranges north of L. Titicaca.

3. This Desert of Atacama is extended southward into 'Temperate' latitudes, mainly owing to the cold Humbolt current, off which evaporation is slow and slight, and which accounts for the constant mist along the west coast in winter Cf. p. 8.
4. As there is practically nothing to stop the east winds, their influence spreads right across the continent up to the very heart of the mountains; and, therefore, the climate generally is less continental than that of any equal area in similar latitudes.

6 With its immense variety of climate and elevation, South America can produce every known plant; but the mass of the country produces grasses and forests.

1. Grass-lands and forest-lands are diametrically opposed to each other, for grasses arrive at maturity more quickly, and trees more slowly, than any other plants. Consequently, grasses are the peculiar product of climates that are subject to great extremes ('steppes') or to long droughts ('savannas'), *e.g.* the llanos of Venezuela, campos of Brazil, pampa of the Plate basin, and steppe of Patagonia; while the forests are the appropriate product of the constant rain and even temperature of the Amazon basin, *e.g.* the Selvas
2. The link between the two is found in the woods along the rivers in the grass regions, and the 'park' lands between the Temperate and Tropical belts, *e.g.* the Gran Chaco ('Great Hunting Ground') and the Matto Grosso ('Great Woods'). Southern Chile is also forested.
3. The grass-lands eventually pass into hot and frozen deserts, *e.g.* the Atacama and the Shingle Deserts, which produce only dwarf vegetation (cf. p. 112); the forest-lands pass into the densest wet-jungle on the face of the earth, producing all kinds of hard-woods and rubber-creepers.
4. Cacao, tapioca, maté tea, cinchona, maize, tobacco, potatoes are all indigenous plants representing different areas of elevation and climate; and rice, sugar, cotton, and coffee have been introduced by Europeans.

7. Most of the useful animals have also been introduced by Europeans.

1. The llama and the alpaca of the Andes ~~are~~ extremely valuable both as wool-producers and as beasts of burden in the almost impassable Andean passes; and the great bird-'colonies' are the source of vast supplies of guano.
2. Horses flourish on the llanos and pampa, and cattle and sheep on the southern grass-lands—the cattle on the wetter and warmer, and the sheep on the drier and colder parts, and pigs are very plentiful, many of them half-wild.
3. The warm shallow waters of the Panama Gulf produce the pearl oyster. Cf Ceylon
8. The very old rock of the Eastern and Northern Highlands is rich in minerals, especially gold and diamonds; and the Andes also produce gold, copper, and immense quantities of silver.

1. The proper development of mining, as of agriculture, has been greatly impeded by the constant and wide-spread political unrest—largely due to the 'mongrel' character of the inhabitants.

*NB*—Deposits of salt are common in and near the desert regions, *e.g.* the western edge of the Pampa and Atacama, and the latter is also rich in nitrates, the present existence of which is due entirely to the absence of rain

### The Western States.

1. ALL these States except Chile stretch across the Cordilleras within the Tropics, and include a Montana, or hilly forested region, along the foot of the eastern slope.

1. The large proportion of artificial—and, as a rule, vaguely marked—frontier is a constant cause of political trouble; and the enormous difficulty of communication across the Andes has more or less isolated these ‘Pacific’ countries, and retarded the influx of foreign civilisation

*N.B.*—The Isthmian Canal has entirely changed the foreign relations, and so the destiny, of these western States

2. The combination of great height with tropical latitude explains the curious variety of products—such plants as beans, potatoes, and wheat being grown on the Cordilleran plateau, while in the deep transverse valleys oranges, bananas, and even sugar-cane can be grown.

2. As Colombia has four distinct zones of climate, it has great variety of products, with the additional advantage of direct access to both the Atlantic and the Pacific, though no longer owning the Colon-Panama railway.

1. The *Tierra Caliente*, or Tropical climate, of the lowlands favours cattle-pastures, forests, and ‘tropical’ agriculture.

The parts sheltered from the Trade winds by the great north spur of the Andes, *i.e.* the lower basin of the Magdalena, and by the southern highlands of Venezuela, *i.e.* the upper basin of the Orinoco, form savannas and llanos, over which enormous herds of cattle (for hides) feed.

Along the Pacific coast, and where there is exposure to ‘Trade’ rains (April-June and September-December), *i.e.* in the upper Amazon basin, there are dense forests—‘selvas’—in which cacao and vanilla are indigenous. The chief product in the east is rubber, and in the west vegetable-ivory (the nut of a palm).

The intermediate lands, with moderate rainfall, raise sugar, bananas, and cacao, the bananas being very important.

2. The *Tierra Templada*, or Sub-Tropical climate, of the foot-hills and upper valleys produces specially coffee, tobacco, and maize, and the coffee and tobacco are sufficiently valuable in themselves to be able to bear the very costly transport. The best coffee comes from Antioquia and Santander; Ambalena and Bucaramanga are tobacco centres. Coffee is even more important than bananas.
3. The *Tierra Fria*, or Temperate climate, of the general plateau produces excellent wheat and fruit, especially round Bogota, and even tobacco, *e.g.* round Medellin; and the pasture is favourable to the raising of beef and mutton as well as hides and wool.

*N.B.*—The *Paramos*, or Arctic climate, supplies the abundance of water on which the agriculture of the drier parts depends

4. There is some mining for precious metals, silver being the more abundant, though the gold is the more valuable, especially in Colima and Antioquia, where there are also coal and iron; but the typical product is from the famous emerald mines of Muzo, near Bogota. (Cf. the Panama pearls and Cosenez emeralds.) Salt is abundant at Zipaquirá, while coal, iron, and lime occur at Pradera.
5. The population is principally concentrated on the healthy *Tierra Fria*, where the fertility is so great that the area is practically self-sufficing, in spite of the large population, *e.g.* in Bogota (120,000) and Medellin (70,000). Elsewhere only the harbours are important, *e.g.* Buenaventura, Cartagena and Barranquilla.

*N.B.*—On account of a bar at the mouth of the river, the Magdalena traffic reaches the sea by the Cartagena Canal or by the Barranquilla railway to Sabanilla (Puerto Colombia).

6. The great drawback to the country is the extreme difficulty—and therefore cost—of transport. The Magdalena is navigable direct to Honda, and the Atrato to about Lloro. But the mass of the transport is still done by mule, which is very slow, uncertain, and costly; and one result of this is that only the best qualities of products, *e.g.* cacao and coffee, can afford the high freightage.

3. Ecuador may be divided into three areas—the Cordilleran, the Coastal, and the Montana.

1. The Andes form a double chain separated by a very rough and broken plateau, which has been covered with extremely

fertile 'weatherings' from the great peaks of Chimborazo, Cotopaxi, Antisana, etc. The abundance of food—wheat, barley, potatoes, lucerne-fed cattle, etc.—produced by this fertile soil, and the healthy dryness caused by the exclusion of the rain-bearing winds, have attracted the mass of the population to centres such as Quito, the capital, Cuenca, and Riobamba.

*N.B.*—The drought in many places makes the aloe a typical plant.

2. The Montana, or forested eastern slope, forms part of the Selvas; it supplies wood to the treeless plateau, and is rich in rubber, fruit, and—apparently—in gold. Cf. the gold of Zaruma.

*N.B.*—There is similar jungle, rich in rubber and 'bamboo-cane,' along the north-west coast—from the Mira to Manta—especially in the Esmeraldas valley.

3. The coast district below Manta receives such a scanty rainfall that it becomes naturally barren; but the facilities for irrigation from the 'eternal snows,' especially in the Guayas valley, and the excellence of the Guayaquil harbour, offer infinite rewards to agriculture. The most important product is cacao—the best in the world; but coffee, sugar, tobacco, vegetable-ivory, and sarsaparilla are all important.
4. There are several other industries of some importance, the most important being the manufacture of chocolate and 'Panama' hats (plaited of toquilla straw while the air is most humid, *i.e.* midnight to sunrise); tanneries, breweries, and saw-mills are multiplying; and the abundance of tallow and vegetable oils encourages the spread of soap-works.
5. The Guayas system is navigable for some distance, and there is a little railway from Duran to Guamote, but communication generally has been till quite recently absurdly backward, *e.g.* even on the 'main road' from the capital, Quito, to the chief port, Guayaquil, a mounted postman having been drowned in the mud, and goods having been sometimes more than *five months* in travelling between the two cities, which are now linked by rail.
4. Peru, like Ecuador, may be divided into three distinct areas—Andes, Coast, and Montaña.
  1. The Montaña is, again, part of the Selvas, very rich in rubber (especially round Iquitos and Nauta), cinchona, and coca (cocaine); and it has the advantage of navigation on the Ucayali and other parts of the Amazon basin, although the most important products—*e.g.* hides, coca, coffee, cacao, etc.—cannot bear transport through the intensely humid climate of the Amazon valley.

2. As the long, narrow strip of coastland is entirely cut off from the S E Trades, it is a rainless, but therefore very healthy, desert ; but wherever rivers from the Andean snows cross this desert, sugar, cotton, tobacco, and excellent wine (*e.g.* at Pisco and Yoa) are produced ; and immense areas might be brought into cultivation by utilising the inexhaustible supply for irrigation. The only important products of the actual desert are guano, nitre, and petroleum (only useful as fuel), but the sugar of the sea-coast and the cotton of the river valleys are very valuable. The cotton, especially in the Picua and Chira valleys, is of a long reddish staple, which does not thrive elsewhere, and which mixes peculiarly well with wool.

<sup>1</sup> There are convenient small ports at many points from Payta (cotton and petroleum) to Mollendo (metals), including the rice and sugar ports of Truxillo, Salaverry, and Huanchaco, but the most important are the foetid hovel of Callao, the terminus of the Oroya 'Railway in the Clouds,' and Chimbote, the terminus of the similar (mineral) railway to Huaraz, and a port for the guano of the Guanape islands.

*N.B.*—The guano goes naturally to ports nearest to the various guano islands, the Lobos, Macabi, and Chuncha, *e.g.* to Eten, Pisco, etc.

The coastal climate, *e.g.* at Lima, and the water-power, *e.g.* at Arequipa, encourage textile industries dependent on the home supplies of cotton and wool ; but except on the N.W. coast the climate is too dry for fine work, and there the special industry is in Panama hats, *e.g.* at Payta and Piura. Home supplies of tallow and various oil-seeds support soap and candle industries in Callao, and Lima has large ice and beer industries (*cf.* the barley of the Huanca-velica district).

3. The Cordilleran area is exceedingly rich in minerals, especially silver and copper, Cerro Pasco and Puno being the chief centres for both. Puno has the advantage of navigation on Lake Titicaca, and railways to the fertile plateau round Cuzco and to the port of Mollendo (crossing the Arequipa Pass at a height of 14,660 feet) ; Pasco is no longer handicapped by the expense of transport (65 miles) by mule or llama to Casapulca, on the Oroya railway, as the latter has been extended to navigable water on the Perene across the Pasco coalfield. Hualgayoc and Hualanca are less important silver centres. *Cf.* the gold of Ayavaca and Carabaya.

The treeless plateaus of Puna and Titicaca are the natural home of the llama, alpaca, and vicuña, which are



even more valuable for their wool (cf the chinchilla fur) and 'morocco' leather than for transport, and the lower part of the general plateau, with its northward (i.e. seaward) slope, supplies splendid cattle pastures and large crops of potatoes and various grains, especially round Cuzco, which is famous for its leather. Cf. the barley-straw 'balsas,' or gondolas.

*N.B.*—Potatoes and maize are natives of Peru, cf cinchona.

5. Bolivia, since it lost its small piece of coast-line by the war with Chile (in 1883), may be divided into three areas—Cordillera, Chaco, and Selvas.

1. The Cordilleran area, as in Peru, is very rich in minerals, especially silver and tin, though copper is also important, e.g. at Corocoro, and borax, e.g. at Ascotan. Oruro is the most important centre, with rail to Antofagasta, Arica, and Mollendo; Potosi and Colquechaca will become at least equally important when they have proper transport, and their silver mines may prove as rich as those of Huanchaca, out of the profits of which the Antofagasta railway was built. The presence of salt-marshes along the railway has facilitated reduction of the ores. Huanuni is the chief tin district. Bolivia produces a quarter of the world's tin.

*N.B.*—Owing to the rapid evaporation, heavy silt and drain of water by the Desaguadero ('Drain') into these marshes, L. Titicaca is drying up.

The salt soil of the general plateau affords good pasture for llamas and sheep, and—in the Ascotan region—for alpacas and vicuñas, and is the natural home of the chinchilla and potato; and the deep river-cut valleys raise great crops of barley, maize, and wheat, as well as large numbers of cattle, mules, and pigs—Cochabamba, Sucre, and Santa Cruz (now being linked by rail with Puerto Suarez on the Paraguay) being the chief centres.

2. The savannas of the Gran Chaco rear enormous herds of cattle, and the railway from Jujuy *via* La Quiaca to the Oruro-Antofagasta line will greatly decrease the cost of transport.
3. Northward of La Paz the plateau descends abruptly through rich 'Yungas'—valleys producing coca, cinchona, cacao, coffee, etc.—to the selvas of the Madeira basin, which, mainly *via* the Mamoré-Madeira railway, export large quantities of rubber. The rapid fall at La Paz—10,000 feet in 200 miles (to navigable water at Reyes)—gives extraordinary facilities for the use of electric power, and the city has also access by rail to the Titicaca port of Chililaya, for the Puno-Mollendo railway. It is a great quinine and coca market.

6. Chile slopes rapidly from the Cordillera to the Pacific, and gently from north to south.

1. This general slope from north to south has resulted in the partial submersion of the southern extremity, the valleys reappearing as fiords (swarming with fish) and the higher lands as a series of islands, and there is a lower and older line of mountains just along the coast, forming with the Cordillera the fertile 'Central Valley'—an alluvial plain 30 miles wide and 500 miles long (Cf. California)
2. In the neighbourhood of the Capricorn Calms there are naturally no regular winds to carry moisture inland; but within the influence of the Anti-Tradewinds there is a constant rainfall, especially in the latitudes of the 'Roaring Forties'. The Central Valley has a beautiful climate, protected from the wet winds by the coast range, magnificently watered from the Andean snows, and with a slope that makes drainage and sanitation perfect.

*N.B.*—The temperature everywhere is lowered by the proximity to the cold Humbolt Current

3. In the southern division of the country, *i.e.* the 700 or 800 miles from Tierra del Fuego to Valdivia, the snow-crowned precipices, with their forest-girt fiords, can support only lumberers and fishermen, but Punta Arenas ships mutton and wool, and Puerto Montt is well situated for shipping the Chiloe coal. Osorno is near the south limit of agriculture.
4. In the northern division, *i.e.* the 700 or 800 miles from Coquimbo to Arica, the rainless desert has preserved enormous deposits of nitrates and borax (cf. the guano, off the coast), which are shipped from various ports from Taltal northwards, especially Iquique and Antofagasta (a *Chiluan* guano port, which also ships the tin and other minerals of *Bolivian*, including the sulphur, bismuth, etc., of the Atacama district). South of the rainless part of this division there is great wealth in metals, especially in copper (Coquimbo) and silver (Copiapo and Caldera); and the beautiful climate of *La Serena* makes the district famous for flowers, honey, and wax. Cf. the Californian honey.

*N.B.*—Such soluble minerals as nitrates of soda (iodine, salt, etc.) and borax, although naturally covered with sand, would have disappeared ages ago in a wet climate! Even Tarapaca is practically rainless

5. The central division concentrates the mass of the population and much of the wealth of Chile. The agriculture—which depends largely on irrigation—includes wheat, barley, grapes, and tobacco; the dry soil is, as usual (cf. p. 112),

very fertile; and the dry air is very favourable for the curing of raisins and tobacco and the picking of fruit, especially apples and walnuts.

The pastoral slopes produce excellent wool and hides, and are backed by valuable forests; and these forested heights inland, like the coast range, are rich in minerals. The special product inland is the copper of the Santiago district; good coal is abundant along the coast, especially round Arauco and Lebu, where there is also gold. Cf the coal-ports of Coronel and Lota.

Besides its copper industry, Santiago uses its local supplies of timber, bark, and hides in wagon and leather industries; Constitucion draws tallow and hides from the rich cattle pastures between Talca and Chillan; Concepcion—at the mouth of the longest river in Chile and near a coalfield—makes 'Chica' and other wines, and has good docks at Talcahuano and a fine out-harbour in Tome.

Valparaiso is, however, the most important harbour and industrial centre (wagons, leather, beer, hardware, etc.); it is more central than Concepcion, and has much better communication inland; it is also the special harbour of Santiago *via* the important junction of San Felipe, and commands both the Portillo (13,780 feet) and the Uspallata (12,780) or Cumbre Passes across the Andes,—the latter now crossed by the railway to Buenos Aires—and the 'Longitudinal Line' from Puerto Montt *via* the Great Valley to Copiapo, etc.

*N B*—The British possession of the Falkland Islands supply, in Stanley Harbour, an important refuge for vessels rounding 'The Horn'; and they have abundance of peat, and an excellent stock of sheep.

### The Eastern States.

1. THE Argentine, or Silver, Republic is a huge low plain backed by 2,500 miles of lofty mountains.

1. About half the total area belongs to the basin of the Plate, or Silver, river, which has given the country its alternative title, and the whole may be divided into four areas—the 'tropical' Chaco, the temperate Pampa, the frigid Patagonian desert, and the mountain zone

*NB*—There is very little silver in the Plate basin, but it was the old route to the Bolivian mines

2. The Chaco region has a tropical climate even outside the Tropics except where it slopes up to the Andes, and, as it is well watered, it is very prolific. The unreclaimed land is largely covered with forests and tropical undergrowth, though the distance from cheap transport prohibits the export of all except Quebracho and cabinet wood (*e.g.* for furniture and carriage works in Buenos Aires), the cultivated land—to the west of the Chaco proper—produces maize, tobacco, and sugar-cane, with coffee on the western hills. Thus, the great junction of Tucuman specialises in sugar and—in spite of the dry climate—distils rum, while Salta and Jujuy also grow coffee, the Misiones district produces the valuable Yei-ba-maté tea

*NB*—As the northern termini of the most important line in the country, Salta and Jujuy have a large transit trade—formerly done by mule and llama, now by rail—with Chile and Bolivia.

3. The Pampa grass-lands are much the most valuable part of the country at present. They are so flat that for hundreds of miles the railways need neither an embankment a yard high nor a cutting a yard deep, and the dead level has led to a great development of railways as well as to a considerable uniformity of temperate climate. The natural grass feeds enormous flocks and herds; and every year more of the pasture is being put under the plough—for wheat, flax, and maize—which will increase the small (though fairly regular) rainfall

Wool and frozen mutton are the most important products, four-fifths of the sheep being fed in the cool latitudes be-

tween Buenos Aires and Bahia Blanca. The cattle are fed on the warmer and damper lands north of Buenos Aires, especially along the navigable rivers, *e.g.* the Plate, Parana, Paraguay, Salado, by which they are exported alive as well as in the form of 'jerked' beef. There are also butter and cheese factories, especially in the province of Santa Fé; and much lucerne is grown, especially round Mercedes. Argentina now dominates the beef market of the world.

*N.B.*—'Jerked' beef is the only cheap meat which keeps well in the Tropics.

Wheat, the most important agricultural product, is raised mainly between Bahia Blanca and Cordoba and in the Entre Rios, and both these districts, especially the latter (as its name might suggest), have great advantages for growing flax (for linseed-oil), *cf.* the oil-mills of St. Elena, Santa Fé, Parana, Cordoba, and Buenos Aires. The maize is grown mainly between Rosario and Santa Fé, and some of it supports local distilleries.

*N.B.*—The cost of transport for wheat, wool, and cattle depends on the import of coal from Europe, the 'colliers' being able to carry home large quantities of bulky goods at low rates

Almost all the important towns in the country are on the Pampa, and are either river ports or junctions on the great trunk lines. From Corrientes—an important river 'dock-yard'—to Santa Fé the traffic is almost all local, but Rosario is a very important 'foreign' port. The 'inland' junctions are chiefly agricultural and pastoral markets about the centre of the various provinces, *e.g.* Santiago; and round most of these irrigation is important, *e.g.* round Cordoba for grain and round San Luis for fruit. Buenos Aires is both the chief harbour (with an outport at La Plata) and the chief junction, and amongst its typical industries are rough textiles and sacks (for grain). Bahia Blanca is becoming a very important wheat and wool port.

4. The dry heat of the volcanic lower slopes of the Andes is climate; but the dry heat of their volcanic lower slopes is specially suited to the vine, *e.g.* round Mendoza and San Juan, where there are many French settlers engaged in making wine, *cf.* the 'Chocoli' wine of Bahia Blanca. Farther north, *e.g.* at La Rioja and Catamarca, even oranges flourish; and the dry air is very favourable to the curing of raisins (*cf.* the flour-milling of the great Pampa cities). These Andean towns are also centres for mining districts (mainly copper), *e.g.* San Juan.
- 5 The Patagonian platform is monotonously chilly, and the industries include the collecting of natural ice and seal-hunting; but the 'semi-desert' conditions have led to the formation

of numerous salt-marshes, *e.g.* near San Blas, the salt from which is very useful in the various meat industries, and both coal and petroleum are found at Comodoro Rivadavia.

2. Uruguay is an extremely fertile little peninsula divided into two areas by the Rio Negro

1. The north and east rise to the Brazil plateau, while the south and west are rich undulating pampa. The nearness to the sea and the latitude guarantee a warm even climate; but the elevation is too low for a heavy rainfall, and trees are not common, though wheat and flax (for oil) thrive.
2. The richness of the pampa is due to the amount of phosphates and alkaline silicates in the soil, and this makes the pasture more suitable for cattle than for sheep. Indeed, the cattle industry is so important that almost nothing else is done on the pampa. About four-fifths of the cattle are raised for conversion into 'jerked' beef; the chief 'saladero' or slaughtering centres are Paysandu and Montevideo; the chief meat-extract factories, *e.g.* Liebig's, are at Fray Bentos; and Montevideo has horn and leather industries. Sheep do well in Durazno and Soriano.
3. Most of the traffic, *e.g.* from Colonia, Fray Bentos, and Paysandu, is done by river; but the cascade at Salto stops continuous navigation farther up stream, and there is a deficiency of railway transport except between the harbour of Montevideo and the chief inland town of San José. This is the main cause of the neglect of the mineral wealth (gold, silver, copper) between Rivera and Santa Rosa.

3. Paraguay is a rich country much handicapped by want of good transport and the historic ravages of war.

1. The Parana, which is much the largest river, is navigable only to Encarnacion; and the only important railway crosses from Encarnacion to Asuncion *via* Villa Rica. Consequently, most of the commerce is done by the Paraguay, and most of the upland towns are along its banks, *e.g.* Concepcion, S. Pedro, Rosario.
2. North of Asuncion there are large areas of dense forest, especially in the Gran Chaco, which yields the most important product of the country—the native yerba-maté; the timber is also exceedingly valuable, especially Quebracho (for railway sleepers and tanning). The less-forested parts of this area raise manioc and maize, the two food staples—

cacao and coffee,—sugar-cane and tobacco, for which the local demand is extraordinary. It should grow fine cotton.

*N.B.*—Even the children smoke cigars regularly.

3. South of Asuncion the low fertile peninsula between the two great rivers grows immense quantities of fruit (especially oranges and pineapples) and tobacco, and there are splendid cattle-pastures. The oranges are unique in size and flavour, and so plentiful that pigs are fattened on them; but the bullock-cart transport rather spoils them for export.
4. Asuncion monopolises the manufactures partly because of the deposits of salt along the railway between the town and Paraguari, and partly because it is the head of navigation for the large steamboats. It makes specially cigars, furniture, leather, and rum (out of local products); soap (made of cacao oil), bricks, and earthenware tiles (for floors where the climate is hostile to wood) are also important.
4. Brazil consists of a huge 'island' plateau surrounded by the continuous valleys of great rivers.
  1. As the rainfall is very heavy except in the interior of the plateau, and as the temperature is very high, forests are common everywhere, and the lower valleys are covered with dense jungle, and, therefore, the whole area may be roughly divided into campos, or lightly forested plateau, and selvas, or densely forested valley.
  2. The special products of the selvas are rubber, cacao, and nuts, the latter mainly from the Rio Negro basin; and there are two special centres—Manaos, which commands the confluences of the great upper tributaries of the Amazon, and Para (or Belem), which commands the part of the Para (or Tocantins) estuary that is used as the chief commercial entrance to the Lower Amazon. Santarem and Obidos are also important, because the approaching exhaustion of the supplies of 'wild' rubber is drawing attention to the cultivation of caoutchouc—as near the ocean as possible.
  3. The seaward edge and coastlands of the plateau between the mouths of the Amazon and the São Francisco produce quantities of sugar, cotton, rice, and tropical fruit. Pernambuco—a roadstead made into a harbour by the 'Reef' to which it owes its other title of 'Recife'—Maceio, and Ceara are the chief sugar ports; Parahiba and Ceara export cotton; Maranhão and Camocim export bananas, etc.
  4. The São Francisco basin (and the surrounding land) grows quantities of the manioc and black beans which are such

important food-staples, and it is also famous for tobacco and cabinet timber, but its special products are the diamonds and gold of Minas Geraes ('Many Mines'), cf. the names of Diamantina and Ouro Preto ('Black Gold'). Uberaba and Goyaz are also important centres, the latter commanding mines of copper, zinc, manganese, and mercury. Indeed the mineral wealth is so great that it has led to the construction of a number of lines of rail inland, especially the extension of the 'coffee' railways from Rio de Janeiro and Santos. Bahia is the great tobacco port, and Aracaju the great timber (e.g. rosewood) port; Caravellas ships cacao.

*N.B.*—Diamonds and gold are also found round Cuyaba, and can be shipped from Cuyaba by river-steamer for Buenos Aires.

5. The great coffee area is the line of forested volcanic highland, with sub-tropical climate (*i.e.* where the trees do not need shade), along the coast from Victoria to Santos; and Rio and Santos (for São Paulo) are the great shipping ports. On the dry western slopes of the hills even the vine flourishes, while the coastal lowlands, e.g. between Campos and Vichero, grow such food-staples as maize, sweet potatoes, and arrowroot. Monazite is exported.
6. The temperate region of the south has some transit trade, e.g. in maté *via* Paranagua from the Parana valley, but the special products are the cattle of the great pastures behind the Mirim and Patos lagoons, and the coal of the coastal range north of Porto Alegre. Rio Grande de Sul is the chief port; and, besides live cattle and dried beef and pork, hides, hair, horns, and bone-ash are exported.
7. Manufactures are generally confined to such necessities of life as can be supplied out of local raw materials—manioc flour and tapioca, coarse textiles, furniture, leather, soap and candles, sugar and rum; the making of cigars and cigarettes is important in Bahia, and diamond-cutting in Diamantina. Cf. Petropolis silks and Niteroy woollens.

5. The Guianas consists of a low swampy plain along the sea and forest-clad mountains inland.

1. As the coast lands are practically made of river-borne mud, especially from the Orinoco and Essequibo, and have intense tropical heat and very heavy rainfall, they are extremely fertile and produce enormous crops of sugar-cane. Indeed, both Georgetown and New Amsterdam owe their importance almost entirely to the sugar trade; and the former has given the name of its river—Demerara—to a particular kind of sugar.



2. There are two wet seasons—December to February and June to August—and the extreme humidity of the climate greatly increases the amount of rum that can be made from the sugar; it also makes the wooded hills inland an ideal site for coffee. The forests supply all the most valuable kinds of tropical timber and balata (rubber); and their supplies of wood and water are very useful on the goldfields of the interior, for which Bartica is the great outfitting centre.

*N.B.*—The Corentyn and Berbice are navigable for about 150 miles apiece.

3. Unsuccessful competition with the Demerara district has led to sugar being replaced by cacao and coffee in Surinam, especially behind Paramaribo and Batavia; and the depreciation of sugar is causing the sugar to be replaced by rice and tobacco even in the British territory.

The vile climate of the mud-bank of Cayenne is specially favourable to the growth of red-pepper, and there are valuable deposits of phosphates on the islands between St. Louis and La Mana.

4. Inland, on the Parima highland, there are magnificent savannas, which only need good transport to the sea to become one of the most important cattle regions in the world.

6. Venezuela may be divided into three main areas—the Orinoco plain, the Maracaibo basin, and the mountains between the two.

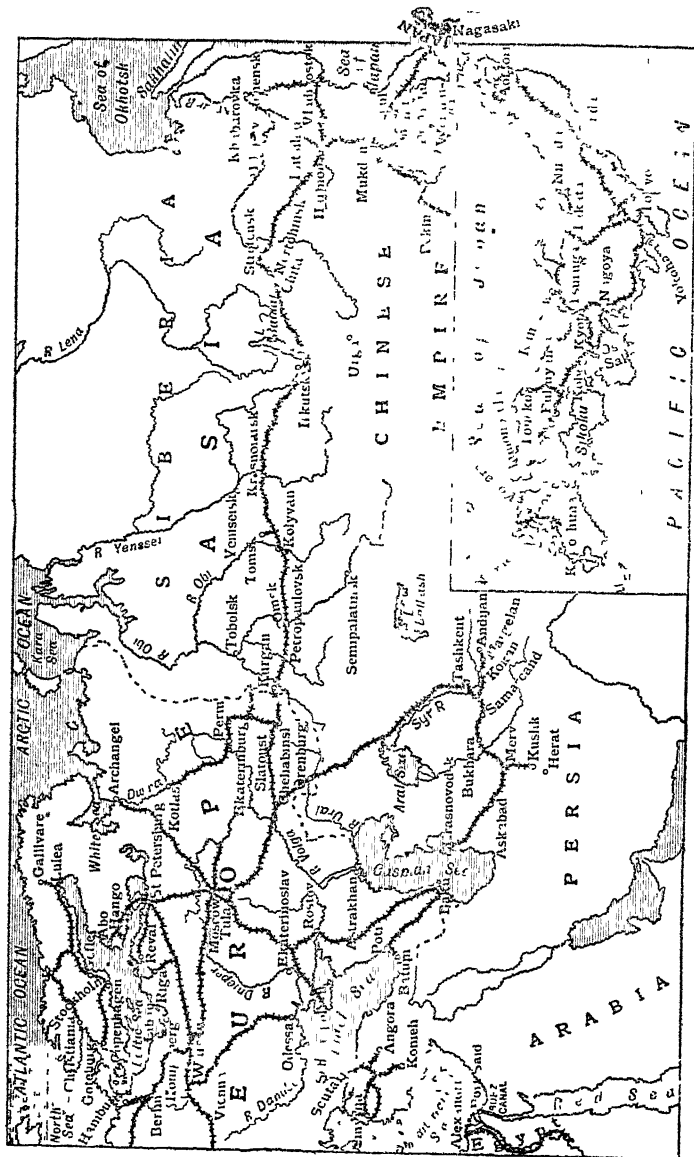
1. The Orinoco 'plain' includes the densely forested edge of the Guiana plateau and the Cordillera, which accounts for the number of cataracts and narrows in the river-system and for the export of rubber and tonka-beans (for perfuming); but it is mainly occupied with the llanos. The products are cattle from the llanos (cf. the leather industries of Bolivar, Barrancas, Nutrias, and S. Fernando), gold from the Callao district of Yuruarí and from round Bolivar, and drugs (e.g. sarsaparilla) and cabinet timber from the plateau. Iron is worked at Imataca.

*N.B.*—Bolivar was formerly Angostura ('The Narrows').

2. As the climate of the Maracaibo basin varies from one of perpetual snow on the Sierra Nevada ('Snow Ridge') behind Merida, to one of equatorial heat on the sheltered shore, this basin can produce all kinds of vegetation; but coffee and cacao are the most important, and are exported mainly from San Cristobal and Valera *via* La Ceiba and Maracaibo. The latter port is decreasing in importance.

however, as the lake is cut off from the Venezuelan Gulf by a bad bar, and is being silted up.

3. The mountain district between the two is the healthiest, and therefore the most populous, part of the country; indeed, where the wet winds are entirely cut off from a low level area, *e.g.* west of Coro and south-west of Maturín, there are even areas of desert, with cactus and thorn. Consequently, all the important towns are up amongst the hills, *e.g.* Caracas, Valencia, and Barquisimeto, and have little railways down to their seaports, La Guaira, Puerto Cabello, Tucacas.
4. Coconuts, which supply oil for soap-works, grow luxuriantly along the shore, but coffee, from the more exposed, and cacao, from the more sheltered parts, are the chief products; and there is some mineral wealth, *e.g.* good marble near Puerto Cabello, coal near Barcelona, and copper at Aroa and between Valencia and Caracas. Cf. the pearls of the island of Margarita ('Pearl'), and the silver of Los Andes and Lara.
5. Nearly half the trade of the country is done through La Guaira, the port of Caracas, and nearly half the exports consists of coffee.



NORTHERN ASIA (RAILWAYS)

## ASIA.

1. THE most important feature of the coast is the series of gulfs in the east.

1. Asia had no 'Mediterranean' Sea to serve as a natural highway of home trade; before the opening of the Suez Canal, the Red Sea only separated desert from desert, while the Persian Gulf separated desert from almost barren mountains
2. The succession of archipelagoes off the east coast, on the other hand, has practically converted the Siam Gulf, China Sea, Yellow Sea, and Japanese Sea, into one continuous inland sea, which has been since the earliest times the scene of a busy commerce—legitimate or otherwise. Cf. p. 101.
3. The only great drawback has been the climate. The typhoons of the southern seas and gulfs are notorious, while the Okhotsk Sea and the Kamchatkan Gulf are as much hampered by ice as the Baltic and the White Sea.

2. Asia is by far the largest and the highest of all the continents.

1. It is four times as large as Europe, and larger than North and South America put together; and it has a number of mountains 5000 or 6000 feet higher than the highest summits of the Andes.
3. The predominant feature is the extent and the height of plateau formation (cf. Africa), which divides it into four wide areas.

1. The Western Plateau stretches from the Black Sea to the Pamirs and the Sulaiman Mountains; the Eastern Plateau stretches from the Pamirs and the Himalayas to the Tchuktchi peninsula.

2. North-west of the whole plateau curve, from the Caspian to the Kolima, are the lowlands of Siberia and the Kirghiz Steppes; south-east of it, from the Indus to the Amur, are the—much more broken—lowlands of Mesopotamia, India, and China.
3. As the breaks between these southern lowlands are again more or less barren plateau, there was very little inter-communication in early times; and, therefore, the various lowland peoples developed quite independently of one another, and so made very slow progress in civilisation. And, as the general watershed is still more barren and inaccessible, the northern and the southern lowlands were still more isolated from each other.
4. The Pamirs may be considered the centre of the whole system, which has considerable uniformity throughout its entire length.
  1. The ranges and plateaus of the west are lower than those of the east: and the eastern ranges separate as they rise, while the western ranges draw together as they fall.
  2. The face towards the northern lowlands is always steep. Thus, the Caucasus, Tian Shan, Altai, and Yablonoi Mountains form a steep continuous face to the Kirghiz and Siberian lowlands; and south of this line there is an area of relatively deep depression, the lowest parts of which are marked by the Black Sea, Kur valley, Caspian Sea, Tarim basin, and Lob Nor.
  3. The central ranges—Elburz, Hindu Kush, and Kuen-lun—rise steeply from this area of relative depression to a great height, from which they have a short slope on to the plateaus of Asia Minor, Iran, and Tibet.
  4. The southern ranges—the Taurus, Zagros, Sulaiman, and Himalayas—rise abruptly from the sea or the flood-plains of the southern lowlands to a still greater height, from which they also have a short slope on to the same plateaus of Asia Minor, Iran, and Tibet.
  5. The eastern plateau may be divided into two areas by the rainless depression of Gobi, or Shamo, the northern being lower and narrower than the southern. This depression is the site of an old sea, vestiges of which are still left in the rapidly-disappearing Han-hai, or Tarim marshes, and Lob Nor; and the surrounding plateaus and the border-ridges entirely prevent moisture reaching it to replenish what is lost by evaporation.

5. The structure of Asia favours the formation of extremely long rivers, with basins of enormous area

1. Only the Mississippi, the Amazon, the Congo, and the Nile, have greater length or larger basins than the Yenisei or the Yang-tse-kiang, but, owing to the scarcity of rain in the interior of so huge a continent, and to the diversity of surface, the rivers have comparatively small volume, and most of them never reach the ocean at all.
2. The predominant feature of the Asiatic river-system is the enormous area of inland drainage, which covers an area much larger than Europe and fully half the size of Africa.
3. Next in area to the inland drainage comes that of the Arctic Ocean, which includes all the northern lowland and much of the plateau. Its predominant feature is the large proportion of *eastward and westward* navigation made possible by the fact that each of the great waterways really consists of *two* rivers of almost equal importance, *e.g.* the Ob and the Irtysh, the Yenisei and the Angara. Cf. pp 229, 241.
4. The same principle is found to some extent, with the same beneficial result, in the Pacific and Indian Ocean drainage areas, cf. the Argun and Shilka, the Ganges and Jamna, the Indus and Sutlej, the Euphrates and Tigris.

6. Over such a huge continent the climate must be generally 'continental,' with great extremes of cold in the north and of heat in the south.

1. At Verkhoyansk there is a 'pole of cold,' the average temperature of January being  $-60^{\circ}$  F, a degree of cold unknown even in Polar regions, the Pat desert is the centre of a great heat area, the average temperature for July being over  $95^{\circ}$  F.
2. In winter, therefore, there must be a powerfully developed area of high-pressure round Verkhoyansk which will result in outflowing winds, and which accounts for very dry N.W., N., and N.E. winds over all the outlying parts of the continent. In summer, on the other hand, there must be equally low pressure over the Pat desert, resulting in an inflowing of very wet 'monsoons.' The whole continent has a typical monsoonal alternation of dry cold outflowing and wet warm inflowing winds, but the alternation in India is largely independent of the rest of the continent.

*N.B.*—The extremities of the S.E. peninsulas are near enough to the Equator to have a double rainy season, with correspondingly even temperature.

3. Both the winter and the summer winds are, of course, affected by the mountain ranges. Even the cold dry outflowing winds have ~~no~~ deposit the last vestige of moisture as they climb the opposing heights; and even the warm wet inflowing winds pass over the low plain of Rajputana (the Thar Desert) without having a drop of their moisture condensed, though they deposit every year fully 50,000 tons of water on every acre of the Punjab slopes *after crossing the desert*.

7. The whole continent may, therefore, be divided into seven climatic areas:—

1. The Arctic cold dry area, *i.e.* the Tundras or Frozen Desert.
2. The Siberian Continental area—an area of great extremes (except in the Kamchatkan peninsula), which increase with the increase of height towards the east and the south.
3. The Monsoon area, which in the more northerly latitudes, *e.g.* China, has a comparatively cold winter; and in which the change of monsoon is accompanied by furious storms—‘cyclones’ in the Indian Ocean, ‘typhoons’ farther eastward.
4. The intermediate area of the Central Plateau,—which is excessively dry, and has great extremes, but on which the height prevents the summer ever being so depressingly hot as it is, *e.g.* in the Aral-Caspian lowlands—and the similarly dry hot deserts of the southern peninsulas, which may be regarded as a continuation of the Sahara.
5. The Mediterranean area, where latitude and the peninsular conditions give Asia Minor an exceptionally good climate, and the somewhat similar climate of the islands, which varies with the latitude.

*N.B.*—Owing to the enormous area, the average winter temperature—except on the south and the south-west coasts—is lower, and the average summer temperature—except on the north and the north-east coasts—is higher than in the same latitudes elsewhere. For the cyclones, cf. p. 158.

8. The uniformity of surface leads to wide dispersion of typical plants.

1. The Tundras vegetation is practically limited to the moss and lichens on which the reindeer feed, and therefore the inhabitants are only hunters and fishermen. Cf. p. 9.
2. The Siberian area, with its loamy soil, supports temperate forests,—evergreens, especially larch, to the north, and deciduous trees, especially birch, farther south.
3. Where extreme dryness and great changes of temperature cause an accumulation of sand, and militate against the

growth of large trees, there are areas of steppe—rich pasture on the borders of the forest lands, and very poor pasture on the borders of the actual deserts. Thus, the Turanian, Tarim, and Shamo steppes are very poor, while those of the upper Irtysh and the Salenga are very rich.

4. The hot deserts of the south-west reproduce African features, both in oasis vegetation and in typical desert plants.
5. Asia Minor reproduces the typical features of South Europe, *e.g.* olives, figs, myrtles, etc., and is generally agricultural.
6. The Monsoon area has typical wet jungle and flood-plain or delta vegetation, *e.g.* rice, jute, cotton, indigo.
7. The sago palm, coco-nut, bread-fruit, and such spices as pepper, nutmeg, and vanilla, grow in the S E islands.

Cf the distribution of the reindeer, yak, horse, camel, and elephant for transport.

9. The mineral wealth is very great, especially in gold, coal, tin, oil, and salt.

1. The gold is most abundant in the north-east, which has probably a geological connection with the Yukon region of America (cf p. 127), and in the Urals.
2. The coal is most abundant in China and the eastern islands, especially Japan, Hainan, and Sakhalin.
3. Tin is the characteristic mineral of the Malay area.
4. The petroleum comes mainly from Caucasia, but also from Burma and Sumatra.
5. Layers of rock-salt are common, *e.g.* in India, and salt-lakes are still commoner in all the desert areas.



### South-Western Asia.

1. As the Pontic and Taurus ranges rise abruptly from the coast, there are few good harbours on the Black Sea or the Levant, but the broken, island-fringed west coast of Anatolia has many excellent harbours.

1. The north coast has no good harbours at all, nor even a safe roadstead except Sinope, but the exigences of trade make Trebizond and Samsun important,—Trebizond as being the most easterly roadstead in the peninsula, and Samsun as tapping the rich wheat district of Sivas. On the south coast Marmarice and Makri have the best harbours, but Adalia (Attalia) and Mersina do most trade.
2. Smyrna, at the head of a deep gulf which has exceptionally good communication inland *via* both the Gediz Chai (Hermus) and the Menderes Chai (Mæander) rivers, is the natural trade-centre for the west.
3. Lemnos, Mitylene, Syme, Samos, and Rhodes have famous harbours; Chios, 'the fertile,' is noted for wine and mastic; and all the islands have a sponge fishery, which is most productive round Syme. Crete has lost its old importance—as commanding the entrance of the Ægean Sea.
4. The only Mediterranean island of any real importance is Cyprus (cf. Ceylon in the Indian Ocean), which consists of a long plain—the Mesoreia—shut in on the north and the south by mountains, which cut off moisture from the interior. The central position of Nicosia is suitable for a capital; Famagusta, though very unhealthy, might be made a good harbour; Larnaka, though only an unsheltered roadstead, monopolises the trade, exporting dates, raisins, and salt—characteristic products of a dry island—carobs, wheat, etc.
5. Even the smaller ones, however, help to form the remarkable series of Imperial 'footholds' by which British commerce with the East is supplied with protection, coal, and telegraph facilities. Cf. p. 21.

2. The surface is a broken plateau, sloping generally from the Erzerûm heights down to the archipelago.

1. The average height of the plateau is broken on the north by the deltas of the Kızıl and Yeshil Irmaks, and on the south by the Pamphylian and Cilician plains.
2. West of the Anti-Taurus range there is wide central plain, dotted with salt lakes, e.g. Tuzla Gol, and merging north-

ward in the barren steppes of Angora, and westward in the railway-threaded defiles of unnavigable rivers

3. East of the Anti-Taurus the general level rises, and is crossed by ranges from E N E to W S W., amongst which the Tigris and Euphrates rise, but here, too, there is a typical volcanic plain dotted with salt lakes, *e.g.* Van.

3. There are, therefore, three climatic zones, with their appropriate vegetation.

1. The north coast has damp muggy summers, and damp cold winters, and the Pontic slopes are covered with timber
2. The plateau, shielded from damp winds off both the Black Sea and the Levant, has a continental climate, extremes increasing towards the east; the better watered parts produce excellent wheat, and the drier steppes are the home of the Angora goat. Cf. the rugs and carpets of Smyrna, and the honey and goats'-cheese of Kara-Hissar.
3. The south and west coasts have a mild even climate, appropriate to the olive, fig, mulberry, orange, 'valonia' oak, opium-poppy, liquorice, etc. Cf. the silk industry of Brûsa.

*N.B.*—The fact that it links Europe to Asia has given Anatolia considerable political importance, and the absence of navigable rivers and other approaches to the plateau has concentrated its importance in a few centres, *e.g.* Brûsa, Manissa (Magnesia), Aidin, Adana, Konia (Iconium), and Kaisariyeh (Cæsarea). The 'Cilician Gates' make Adana specially important. Cf. the position of Erzerum between the upper Euphrates and Aras valleys

4 Mesopotamia, though—under the Turk—a dreary land of ruined cities, still possesses its old advantages of soil and climate, and irrigation and railways are renewing its importance

1. The great plain of Upper Mesopotamia contains now only two cities—Mosul (Mespylce, 'Central Gates'), where routes to and from the Black Sea, Persian Gulf, Caspian and Mediterranean intersect, and Diabekr, which commands all the trade converging on the river-cut passes between the Syrian desert and the Kurdistan mountains, and which is the head of raft (inflated sheepskins) navigation on the Tigris.
2. The lower plain, ancient Babylonia, is being transformed from a fever-breeding swamp into 'a garden of the Lord'. Baghdad has an unrivalled position for inland trade (by rail and pack), and is the head of steam navigation; Basra is the port for ocean steamers, and exports cereals (mainly from Kut-el-Amasa), petroleum, and enormous quantities of dates, Kurna commands the confluence of the two great rivers in the Shat el-Arab. Cf. p. 193, § 8.

*N.B.*—A telegraph line from India passes up the Euphrates valley to Scutari

5. Syria has no good harbours, but several roadsteads.

1. Haifa, in the lee of Mount Carmel, has the best shelter ; but Beirut and Iskanderun (Alexandretta) do most trade

6. The surface consists of a coastal plain and a deep 'rift-valley' between parallel ranges of mountains.

1. Along the rocky northern coast the plain is very narrow, but south of Mount Carmel the plains of Sharon and Philistia are much broader ; and east of Mount Carmel the plain of Esdraelon gives easy access to the Jordan valley.
2. The mountains are high enough to have heavy falls of snow, which give unfailing supplies of water to the Jordan and the Orontes ; and their sides feed numerous flocks of sheep.
3. The Jordan valley is the deepest depression in the world—the Dead Sea being 1300 feet below the level of the Mediterranean—and the heat is therefore so intense that the Dead Sea is excessively salt, and the river-side vegetation is tropical

*N.B.*—The value of the land might be greatly increased by irrigating the whole valley from L. Tiberias

4. This land, which was once 'flowing with milk and honey,' is now practically barren, as reckless felling of the forests has deprived the soil of all protection against winter storms and torrents ; but wheat is still produced on the plains, and wool on the hills. The olive and the vine are less important now, however, than oranges and tobacco (cf Jaffa and Latakia). Cf p. 17.
5. Under the conditions of modern trade, the country is much impeded by its physical obstacles. For instance, the railway from Aleppo to Iskanderun must traverse the high Alma Dagħ range, that from Tripoli to Homs and Hamah must cross a rocky desert to reach the Orontes valley ; and the main line from Beirut to Damascus crosses the double Lebanon range.

*N.B.*—The importance of Damascus is due almost entirely to the waters of the Abana, from Anti-Lebanon

7. Isolated by sea on three sides, and with no great trade route across its pathless deserts, Arabia had to turn to maritime enterprise.

1. The west coast has no harbours, and its roadsteads are made difficult by shoals and coral reefs ; but Jedda (for Mecca), Yambo (for Medina), and Hodeida (for Sanaa), are busy

centres. Besides several island harbours, *e.g.* Perim, the south coast possesses in Aden the best harbour within a radius of 1000 miles ; and the east coast has a fine harbour in Muscat, and a number of pearl-fishing stations on the islands of the shallow Persian Gulf, *e.g.* Bahrein

2. Across the central plateau, which forms a third of the country, a ridge joins the Nejd to Mecca, and this ridge is scarred by deep valleys in which water makes the desert 'blossom as the rose.' This is the home of the Arab horse, the Arab camel, the Arab donkey—all of them the most perfect specimens of their kind. It is also the favoured land of the date-palm
3. Mountainous districts also form a third of the whole area, and those of El Yemen and Oman have a better climate than any other part. The Yemen ravines, with their rich volcanic soil, are the home of the 'Mocha' coffee—exported from Hodeida and Aden ; the Hadramût valley is famous for frankincense and myrrh—exported from Makalla

*N.B.*—The other third is desert, and includes a strip of desert—the Tehama—even round the coast. The Sinai peninsula is rich in turquoise.

4. The Yarmak basin, which greatly facilitated the construction of the Haifa-Jordan line northwards to Damascus (and Aleppo), has also—like the Jabbok valley—favoured the construction of the 'Hamidie-Hejaz' (Damascus—Mecca) line southwards to Medina. This will eventually get access to the sea at Akaba and Jidda, and at Iskanderun ; but at present its only outlets by rail are Beirut and Haifa.

## 8. The politico-economic enterprise of the Baghdad Railway has made considerable progress

1. It seems to be in working order as far at least as Nisibis, with full connexion with the Syrian system and its ports (Alexandretta, Tripoli, Beirut, Haifa, Taffa, etc.), and various sections seem to be working in the far east, *e.g.* that from Baghdad to Samara.
2. Steamers ply on the Euphrates from Jerablus to Feluja (for Baghdad)—a week's journey.
3. The recent Balkan War severed the continuity of the 'Berlin, Vienna, Constantinople, Baghdad' line.

### The Iran Plateau.

1. THE water frontier of Persia is of little value, even for commerce, except the small portion on the Caspian.

1. Unfortunately Resht, which is the best harbour and has the best communication inland—by a good road to Tehran—can only be reached *via* the Russian railway from Batum to Baku, where it is connected with a direct steamer service to Resht, but the 'Tiflis' line is now extended into Persia *via* Tabriz.
2. Other ordinary routes for commerce in the north are from Mashad *via* Asterabad to the Caspian port of Gez, or from Tabriz *via* Erzerum to Trebizond; but the proposed railway from Askhabad to Mashad will probably divert all the Khorassan trade to the Russian *Trans-Caspian Railway*.
3. The Persian Gulf ports are mere roadsteads, but give a variety of routes inland, *e.g.* to Yezd *via* Kerman from Bandar Abbas, and to Ispahan from Bushire *via* Kazerun (tobacco) and Shiraz, or from Mohammera *via* Shuster.

2. The surface of the plateau is composed either of broad plains shut in by parallel mountain ranges, or of mountain masses honeycombed with ravines.

1. The ravines are much more fertile than the plains, and a third of the whole area is salt-desert—useless, except for the salt. Cf. the Dasht-i-Kavi and Dasht-i-Lut deserts.
2. The climate is very dry, with very great extremes, except in the N.W. and N.E., where the mighty Elburz range does not cut off the influence of the Caspian from the interior, and the lack of rains is a great obstacle to agriculture.

*N.B.*—The Caspian lowlands are even forested.

3. Animals, especially horses, mules, and sheep, are therefore more important than agriculture, though the irrigated valleys are very fertile, producing particularly beautiful roses, and opium, tobacco, wheat, mulberry, all kinds of fruit (including dates), cotton, and pistachio nuts. Thus, Yezd—amidst its mulberry groves, and Ispahan—amongst its wheatfields, are famed for their woollen felts, while

every town on the intervening ridge of mountains—from Kashan to Kerman—manufactures the famous Persian rugs and carpets. Khorassan wool is the best.

4. The chief towns occupy characteristic positions. The political capital of Tehran is in the centre of a riverless plain protected by the most inaccessible part of the Elburz; the commercial capital of Tabriz commands the trade across the 'isthmus' (cf Armenia with Palestine, p. 192) and manufactures leather, silk, and metal-work (gold and silver); Mashad manufactures silk and velvet, swords, and jewelry (mainly from the great turquoise mines of Nishapur); Ispahan has industries in weapons, velvet and brocades, opium, and dried fruits; Shiraz is famous for wine and attar of roses, Kerman for brass cups, and Kashan for silks and gold-brocade. Gilan, Khorassan, and Yezd produce most silk, Lingah is a pearl port
5. Persia is rich in minerals, but want of ports, or of markets, or of roads, or of materials for working the mines has greatly impeded their development. Better roads are being made, *e.g.* the new one from Ispahan to the river-port of Ahwáz, but the other drawbacks still remain.

*N.B.*—The Russian sphere of influence is bounded by a line from Kerman-shah *via* Ispahan and Yezd to the point where Afghanistan, Persia, and Russia meet, the British by a line from Bandar Abbas *via* Kerman to Birjand

3. Afghanistan is the barrenest and wildest part of the great Iran plateau

1. The only important industry is the manufacture of (very excellent) fabrics out of camel's-hair, wool, or mohair, *e.g.* carpets
2. Two commercial routes—from Mashad and Bukhara—converge on the fertile province watered by the Hari-rud ('River of Herat'), the valley of which is the best route from the north-west to India, two other routes—*via* Khulm and the Khaibar Pass—converge on the political capital of Kabul, and two—*via* the Bolan Pass and the Halmand valley—converge on Kandahar.
3. Kandahar dries the fruit of its irrigated orchards, Kabul is famous for its camels'-hair cloth, Herat exports indigo and asafetida, hides, opium, and raw-silk; coarse cottons and posteens (sheepskins) are made in all parts of the country.

*N.B.*—Baluchistan is geographically an extension of Afghanistan, but politically part of India.

## India.

1. AS India lies between an enormous area of land and an almost equally enormous area of sea, it has very marked alternation of dry and wet seasons.

1. The coast, though long, is not very accessible. In many places, especially round the north and the east of the Bay of Bengal, it is simply swamp; and at the mouths of the great rivers, which should naturally give the easiest access inland, the strength of the river current and the conflict of sea and river make navigation difficult and dangerous, especially on the Hugli.
2. Between the various river-mouths the coast is monotonously regular, any possible harbours having been largely ruined by sand washed up by the sea and mud brought down by the rivers. Cf. the African coast, p. 226.
3. Bombay is an island harbour—large, safe, and easily accessible—opposite the southern entrance to the Suez Canal, *via* the Red Sea. It had very bad access inland until the construction of railways across the Western Ghats, and it has no local supplies of coal, but it is the natural outlet for the trade of Western India, the Deccan, and the Central Provinces, and, therefore, its chief exports are cotton, wheat, and opium. It gets water power from the Western Ghats.
4. Karachi is the great wheat port of the Punjab, and also exports products of the Western Himalayas. It is far enough away from the mouth of the Indus to be safe from the constant currents and periodical floods, and the level of the Indus plain has made the construction and the working of railways and canals easy and cheap. As the nearest point to Quetta and New Chaman, it has also considerable political and military importance.
5. Calcutta is one of the most dangerous and expensive harbours in the world. Both the danger and the expense come from the terrific force of the river-currents, especially during the summer rains; and, when this fierce downward current meets a spring tide going up the river, the result is a 'bore' of the most dangerous description, travelling for

## INDIA.

100 miles up stream at the rate of 18 miles an hour, and a height of 5 to 10 feet.

As the natural outlet for the immense agricultural wealth of the N.E. corner of Hindustan, which consists partly of deep alluvial plain and partly of high forest-clad mountains, with great heat and very heavy rains, it exports much rice, jute, tea, and indigo; and it has the great advantage of being near the best coal-mines in India—at Raniganj, in the Damodar valley.

6. Madras stands on a surf-beaten coast, without either a navigable river or necessary shelter. Its special trade is in teak from the Western Ghats, sugar and coconut-oil from the Coromandel coast (cf Masulipatam), and such products of Mysore as go eastward.
7. The land boundaries offer practically insurmountable obstacles to invasion and commerce except in the north-west, which is accessible by two or three deep defiles across the Sulaiman Mountains, especially the Khaibar and the Bolan Passes. Cf p 195.

*N.B.*—The Himalaya Mountains run along the north for 1500 miles, with an average height of 17,000 feet, and an average width of 150 miles; at least 100 peaks are at least *four miles high*, and there are miles upon miles of glacier.

2. India consists of a low oblong plain in the north, and a high triangular plateau in the south.

1. The northern, or continental, half is lower, and thus hotter than the southern, or peninsular, half; and it includes politically, but not geographically, the dry, dreary plateau of Baluchistan (with its useful dwarf palm), on the west, and the rich river-valley of Burma on the east.

3 The Indo-Gangetic basin is one huge plain—Hindustan—shut in by mountains except in the SW and S.E.

1. The mountains in the north, being of gigantic size, supply the water for the magnificent rivers of Northern India, on which the very existence of commerce and agriculture depends.
2. The 'mountains' which separate the estuaries of the Indus and the Ganges, include the Vindhya range, but are really the high northern edge of the peninsular plateau.
- 3 The pace and volume of the rivers, and the height from which they fall, cause them to carry down an immense amount of alluvium, which is invaluable for agriculture;



and the low level of the plain offers every facility for irrigation and communication.

4. The peninsula of the Deccan is practically a continuous plateau shut in by mountains.

1. On the west the Ghats are high, steep, and very near the sea; and, therefore, they are a formidable condensing medium to wet winds from the S W, and a formidable obstacle to commerce. But the Eastern Ghats, being low and discontinuous, present little obstacle to winds or commerce
2. As the double northern range—the Vindhya and Satpuras—run east and west, they present little obstacle to the S.W. winds, and the valleys of the Nerbada and the Tapti, and the Khandwa depression across the Satpuras, greatly facilitate communication.

*NB*—The *Great Indian Peninsular Railway (G I P)* follows the Khandwa route, Khandwa being a junction for Allahabad, Benares, Delhi, etc.

3. The Nilgiri Hills, in which the two Ghat ranges meet, are nearly 9000 feet high, *i.e.* twice as high as Ben Nevis, and thus they have become one of the most important sanatoria in India. Just south of them there is a very curious defile, the Gap of Coimbatore, which separates them from the still higher Cardamum Mountains, and which gives easy communication, *e.g.* between Calicut and Trichinopoly or Madras.

5. The three great rivers of Hindustan supply the soil, manure, moisture, drains, and highways of carriage for all the wealth of the plain.

1. The Indus is usually navigable for small vessels for 900 miles—up to Attock ('Limit'), but it brings down so much mud that it is often choked up, and, therefore, its great and permanent value is for irrigation. With its four chief tributaries, it has made the Punjab ('Land of Five Rivers') one of the wheat granaries of the world

*NB*—The absence of large towns along the Indus is significant of the character of the river. Contrast the Ganges, p 4.

2. The Ganges, though nominally the main stream, starts on the south of the Himalayas, and is inferior in length and volume to its Ghogra 'tributary,' which starts on the north. The Ghogra supplies the volume and the mud, while the Ganges is the more useful for navigation, especially as far as Cawnpur; in fact, the whole course of 1200 miles from

Hardwar, where the river drops on to the plain, to the ocean is of more or less value for navigation.

3. The Brahmaputra has such volume and pace that it is quite uncontrollable; so in the meantime it is less useful than the Ganges or the Indus

6 The north and west edges of the plateau receive enough rain to give birth to considerable rivers.

1. The Narbada, Tapti, and Mahanadi are invaluable to agriculture; their valleys offer natural routes for railways, the direct route from Bombay to Calcutta running for miles along the Tapti, and the valleys of the Narbada and the Tapti have a distinct effect on the climate
2. The Godaveri, Krishna (or Kistna), and Kavari are all more or less useless for navigation, but invaluable for irrigation; and they all form deltas of inexhaustible fertility.
3. The Irawadi is one of the great commercial highways of the world. It is navigable almost up to the Chinese frontier, Bhamo being the head of navigation, and practically attracts the whole population of Burma to its banks, especially along the 400 miles between Rangoon and Mandalay, for fishing and agriculture (rice and cotton).

7. As India stretches for nearly 2000 miles from N. to S., and varies in height from a few feet below to  $5\frac{1}{2}$  miles above sea-level, the climate also varies greatly.

1. This variation depends much more on longitude and elevation than on latitude; the average temperature of Hindustan is actually higher than that of the Deccan, and the difference between the Thar Desert and Bengal is greater than that between the plain and the plateau, the regulating factor being the distribution of the Monsoons.

*NB*—There is heat enough to ripen crops all the year round, and the distribution of population is determined by access to water, not by heat.

2. From May to September (more or less inclusive), the up-draught from the heated continent draws the S E. 'Trades' across the equator right up to the Himalayas, the rotation of the earth deflecting them, north of the equator, so that they reach India as S W Monsoon winds.
3. During the 'northern' winter the N E Trades blow regularly from the Tropic to the Equator, and are called the N.E. 'Monsoons.' They are naturally dry winds but towards the

east they gather sufficient moisture off the Bay of Bengal to deposit a fairly heavy rainfall on the low Eastern Ghats. Cf. the N. E. of Ceylon

4. As the S.W. winds come over hundreds of miles of tropical sea, they arrive saturated; and, as they naturally deposit their burden towards the N. E., the heaviest rains are on the Western Ghats and on the Khasi Hills. On the latter, Cherra-Pungi has recorded an annual rainfall of more than 22 yards.

*N. B.*—The S. W. Monsoon is deflected up the Ganges valley as a S. E. wind by the great wall of the Himalayas

5. The whole Indo-Gangetic basin may, therefore, be divided into five areas—dry hills and dry plains in the N. W., damp hills and damp plains in the N. E., and a medium climate with a medium elevation on the water-parting of the Delhi ridge, a good place for a capital.

*N. B.*—Where the level is so low that there is absolutely no condensing medium, as in Sind, or where mountains entirely anticipate the wet winds, as in Mysore, there are areas of desert and semi-desert. Cf. The Thar

8. As motives of economy, the climate, and religious scruples cause the vast majority of the people of India to live mainly on vegetable food, agriculture is enormously important, nine-tenths of the people being engaged in it, directly (seven-tenths) or indirectly.

1. Rice and millet form—with the fruit of the mango—the staple food of the natives. Both are nutritious and prolific, but rice requires the more moisture; consequently, rice grows on all the deltas and low coast-strips, especially round the Bay of Bengal, and up-country wherever the land can be flooded, while millet grows inland, especially in the province of Madras and west of the Thar Desert.

*N. B.*—Burma produces rice (along the Irawadi and on the Salwin delta) to the value of some £6,000,000 a year, but in Hindustan and the Deccan the population is so dense that all the millet and nearly all the rice is needed locally.

Oil seeds, especially linseed and rape, are somewhat a subsidiary crop to rice, and are in demand locally for food, outward application, and lighting purposes

2. Wheat flourishes on the low dry plains in the upper basins of the Indus and Ganges, especially in the Punjab, and on the high dry tableland of the Central Provinces.

*N. B.*—The wheat districts can grow also good barley.

3. Cotton has the same climatic connection with rice as wool has with wheat ; and so it flourishes in the Ganges valley and on the sticky 'black-soil' lands of Bombay, especially on the plains of Khandesh, North Berar, and Wardha—where the soil is a fertile decomposition of volcanic rock, and the S W Monsoons have access *viz* the Tapti valley. It also grows in the Indus basin, *e g* between Karachi and Haidarabad and between Multan and Peshawar, and in the Kistna valley, *e g* between Hubli and Wadi and between Bellary and Masulipatam The quality is very poor.
4. Jute grows better on the sand-banks of the Bengal rivers than anywhere else in the world, especially between Goalpara and Purniah, where the Brahmaputra more than repairs the ravages caused by such an exhausting crop.
- 5 Tobacco is grown mainly on the low lands along the Kavari, the Sabarmati, and the Irawadi, especially round Trichinopoly and Kaira
6. Assam provides an excellent site for the Lowland variety of tea, especially round Silchar, Sibsagar, and Dibrugarh ; and the Darjiling, Dehra-Dun, and Kangra valleys provide equally good sites for the Highland variety, the latter being also grown on the slopes of the Nilgiri and Cardamom Mountains
7. Opium had a political importance, *cf* tea and tobacco, because it gave local employment to a considerable number of workmen It is still a source of some revenue to the Government, being grown from Ahmadabad and Baroda to Gwalior and Jhansi, and from Lucknow and Cawnpur to Patna and Gaya, especially at Patna, Faizabad, and Ghazipur ; but it is being replaced by cotton.
- 8 Coffee comes mainly from the Ghat valleys of Coorg and Mysore, and from the Madras districts of Malabar and the Nilgiris, where the water supply is plentiful, the heat great, and the accumulation of vegetable refuse enormous
- 9 Indigo, which also employs local labour, is being grown in Behar, Bengal, and Madras ; cinchona is planted largely to protect the seedlings in the Himalayan tea gardens, though very valuable in itself for its 'Peruvian bark', and pepper is grown specially round Tellicherry and Alleppey (Alapalli).
9. Pasture must be limited in a densely-peopled country like India, except where the rainfall is insufficient and there are no facilities for irrigation.

1. As milk is very important to an almost vegetarian population, cows are kept everywhere, but the special demand for horned cattle and zebu for transport and field labour is supplied largely from the saline semi-desert land between the Lunj river and the Aravalli Hills.
2. The dry hills of the N.W. feed sheep and goats, which are kept mainly for their wool, most of the beautiful Kashmir 'wool' is 'mohair,' &c. from goats. Cf. the great Leh market.
3. The Mysore forests and the damp forested hills of the N.E. and the Malabar coast still harbour the elephant; the sandy desert of Sind requires the camel; and the salt plains of Rajputana are famous for their wild asses.

10 The forest products include teak, sal, and deodar—bamboo, mango, and palm.

1. The teak comes from the wet jungles of Bombay, Assam, and Burma; the sal is characteristic of the drier climate of Central Hindostan; and the deodar and other cedars are sub-tropical trees from the slopes of the Himalayas, (cf. the great furniture industry of Bareilly)

*N.B.*—Lac and tasar-silk ('tussah') are very important by-products.

2. The bamboo and mango are two of the most useful products of India, the latter providing food (between the grain harvests) to thousands of peasants, and the former providing almost every possible kind of utensil and furniture.
3. The most useful palm is the coco-nut, which grows along the shores in the Tropics, and supplies fibre for mats and ropes (cf. § 13 (2) below). The date palm also is found—along with sandal-wood—on the dry hot plains of the Deccan, especially in Mysore.

11. The minerals, though much less important than the vegetation, are valuable, and include coal, salt, oil, tin, gold, manganese, mica, and precious stones.

1. The coal is found in the Damodar and Narbada valleys, and in the hills of Chutia Nagpur, where it is very useful for the two railway routes from Bombay to Calcutta. There is also some in the Godavari valley, near the main line from Bombay to Madras; and a few small fields—of excellent quality—have been found in the N.E. of Assam.
2. The salt is dug from the 'Salt Range' in the N.W. of the Punjab, especially at Kohat, and evaporated along the

coasts and from the brine lakes of Rajputana. Behar has large deposits of saltpetre

*NB*—Jaipur, a great salt market (for L. Sambhar) supplied the white marble and red-sandstone for the palaces of Delhi and Agra

3. The petroleum is found chiefly in Burma and Upper Assam ; and there are rich deposits of tin—the characteristic metal of the Malay Peninsula (cf. Queensland and Tasmania)—in the Tenasserim district of Burma. Cf. the jade of Upper Burma, also very rich in wolfram.
4. The gold is found mainly in Mysore, especially at Kolar (where coal is dear and water very scarce, but electric power can be brought from the Kaveri Falls), and most of the precious stones are in the Deccan and Burma (rubies).

12. The typical (*i.e.* mainly old) industries of Indian cities are concerned particularly with the 'hand' production of 'luxuries'—for Native Courts.

1. The old 'hand' textiles are still represented—*e.g.* in the old cotton areas of Bengal and the Coromandel coastlands, by the fine muslins of Dacca and Madras (cf. Calicut *calico*)—in the old raw-silk areas of the Ganges and Kaveri valleys, by the figured silks of Murshidabad, Benares, and Trichinopoli (cf. the brocades of Ahmadabad),—in the wool areas of the dry N W, especially Kashmir, by the shawls and rugs of Srinagar, Amritsar, and Ludhiana,—and, in the safflower and cotton district of the Kabul valley, by the Afghani wax-cloth of Peshawar
2. The old 'art' industries, mainly in metal, ivory, and leather, also linger on, *e.g.* in the brass-work, gold-cloth, and lacquer of Benares (cf. the brass-work of neighbouring towns, *e.g.* Mirzapur, Allahabad, and Chapra), the gold and silver filigree of Cuttack, the gold and silver lace of Lahore, the gold and silver embroidery of Lucknow, the gold-lace and mosaics of Agra, the ivory and grass-work of Poona (cf. the ivory work of Murshidabad and other towns on the edge of the N E. forests), the leather work of Cawnpur and Lucknow, the enamel of Multan and Jaipur, the diamond-cutting of Haidrabad (cf. the site of Golconda), and the jewellery of Meerut and Delhi.

*NB*—The old lac industry of Mirzapur has developed into a modern factory industry with over 40 factories in the city

3. Opium is manufactured specially at Patna, and tobacco (mainly cigars and cheroots) at Trichinopoli, Dindigal, and Kaira (cf. the 'Baroda' cigars and the snuff of Jodhpur).

13. The modern (*i.e.* mainly imported) industries are concerned particularly with the 'machine' production of 'necessaries'—for foreign markets.

1. The cotton industry is almost monopolised by the Bombay Presidency, which has 72 per cent. of the spindles and 78 per cent. of the looms in the whole country, mainly in Bombay City and Ahmadabad (cf the paper industry).
2. The jute industry, mainly in gummy sacks, is practically confined to Calcutta, where textile and wood waste support also large paper works (cf the paper of Alwar and other towns in the Jumna cotton district); and the same area is the chief producer of oil (linseed, rape, and mustard), though Madras monopolises the coco-nut oil industry.
3. The drier and higher parts of the barley districts are specially famous for breweries, mainly to supply the military centres. The industry is, therefore, most important in hill-stations, *e.g.* Muree, Darjiling, Poona, Utakamand,—military centres, *e.g.* Lucknow, Rawal-Pindi, and Quetta,—and places where the general climate is more than usually favourable to Europeans, *e.g.* Bangalore (also a great cotton market) and the very important railway junction of Jubalpur.

14. During the war India was an exceedingly important source of saltpetre, manganese and wolfram, hides, jute, and oil-seeds.

1. It produces very nearly one-fifth of the world's crop of cotton-seed, though its yield of lint is very poor (not 100 lb. per acre against nearly 200 lb. even in U S A), and some people look to India to provide the 1,000,000 extra bales of cotton which the world is needing.

## 'Indian' Islands.

1. CEYLON reproduces closely the climatic and vegetable conditions of the south of the Deccan.

1. As an island, its temperature is rather more even, and its rainfall more certain, but the dominating factor is still the Monsoons, and the east is still much drier than the west.
2. The island of Rameswaram, and the series of coral reefs called Adam's Bridge, make an almost continuous division between the Gulf of Manar and Palk Strait; the warm shallow waters of the Gulf contain the valuable pearl-oyster, and their shores are covered with coco-palms (oil and coir).

*NB*—Surveys have been made for a railway across Adam's Bridge.

3. The whole island slopes up to the central mass of Adam's Peak; and the gradient, the deep forest refuse, the heavy rain, and the iron-impregnated soil, make it an ideal site for the tea plant. As usual, cinchona accompanies the tea.
4. The island contains very rich plumbago (graphite) mines; the river gravel is rich in rubies and sapphires; and the forest products include cinnamon and nutmeg.

*NB*—Somewhat similar graphite is found in Travancore.

5. Colombo, a magnificent artificial harbour, is the most central port of the Indian Ocean, and controls almost the whole export trade, most of which used to go *via* Galle. Trincomali is a finer natural harbour than Colombo; but its inaccessible situation leaves it without trade except as a naval station.

*NB*—Coconut-oil being the best 'base' for 'ship' soap, &c. for use in salt water, there is a large demand for local 'coconut' soap both at Colombo and at Trincomali. Coconut products come next to tea in value.

2. The smaller islands in the Indian Ocean export mainly coconut products and turtle-shell.

1. The Andamans have in Port Blair one of the finest harbours of Asia, and a great 'timber' port in Stewart Sound, and Diego Garcia is an important coaling-station.



## Indo-China.

1. SIAM is a land of parallel mountain ranges running N. and S. drained by the Menam and Mekong.

1. The Menam system has much the wider and richer basin, the hills being covered with teak and the plains with rice, while the villages are surrounded by bamboos, areca-palms, and coco-palms; and the western ranges are rich in tin, *e.g.* west of Raheng. Cf Salang (Junkseylon).
2. The damp heat and the thick jungle make the climate very deadly, even to the Chinese miners in the gold districts of Kabin and Wattana on the Korat plateau
3. Bangkok, the capital, is the only sea-port, and cannot give access to large vessels; Ayuthia is a river port, collecting rice, teak, bamboos, and rattans for export *via* Bangkok. Trade is also carried on *via* Maulmein and Tavoy.

*N.B.*—Boat-building is important at Bangkok, silk-weaving at Battambang, the conversion of deer-horns into medicine (!) at Korat, and sugar-refining at Chiang-mai (Zimme), Pahi is famous for sapphires and Nawnog for rubies

2. The Malay Peninsula reproduces the characteristic features, vegetation, and minerals of Southern Burma, with increased heat and moisture.

1. As in Burma, the low coast-lands produce quantities of rice, the river valleys produce bamboos and all kinds of hard timber, and the mountains (which are 8000 feet high) yield about half of the total supply of tin in the whole world. All the Protected Native States produce tin, especially Perak (in the Larut and Kinta districts); and their products include rubber, rattans, camphor, sago, pepper, and coal.
2. The rest of the peninsula produces palms along both shores, especially the coco-nut and areca-nut; rubber, teak, and rattans, gambier, pepper, and tapioca from the plantations; and various kinds of spice and gum
3. Penang ('betel-nut') ousted Malacca as the chief centre of trade, thanks to the good harbourage between the island and the mainland of Wellesley, but it has now itself been ousted by Singapore, which has a magnificent and absolutely

free harbour on the enormously important waterway of the Malacca Strait. As the island is very low, and has a very hot, damp climate, it is remarkably unhealthy, but can produce such plants as pine-apple, gambier, and pepper.

4. The Malay area dominates the rubber market of the world, producing well over half the whole crop (c. 200,000 tons). The Federated States lead with 60,000, and the Straits Settlements raise nearly 50,000, while India and Ceylon add another 25,000.

### 3. French Indo-China consists of three areas—Tongking, Annam, and Cambodia-Cochin-China.

1. Tongking is a forested highland encircling the pirate-haunted delta of the Red River and the Thai Binh; Hanoi is the capital, and Haiphong is the chief harbour—exporting teak, rice, and coal. Annam is a high mountain chain, which cuts off communication with the Mekong; Tourane, the best harbour, is near valuable deposits of coal, and exports teak, spices (pepper), tea, sugar, and coffee; and the mulberry-groves and fisheries are very important. In both Tongking and Annam there has been great railway development, especially along the coast (where Vinh and Tourane are important centres), and up the Song-ka valley (where Hanoi and Laokai are important).

*N.B.*—The Mekong is spoilt by rapids, especially at Khong and Kemmarat.

2. Cochin-China and Cambodia are the delta of the Mekong—one of the largest deltas in Asia, and, though the great Tonlé Sap Lake helps to moderate the floods, the inundations are so regular that the rice-crop is enormous. Saigon monopolises the export, but the chief rice factories are at Cholon. Puom-Penh is the chief upland centre.
3. In the great lake and all along the China Sea coast there is a busy fishing industry, *e.g.* off the old Annam stronghold of Hué, and a great deal of salt is evaporated.

## Japan.

1. THE mass of the country ( $30^{\circ}$ - $45^{\circ}$  N.) is very mountainous and largely volcanic.

1. The position to windward of a populous continent, the possession of splendid harbours and abundance of coal, and the insular climate are great commercial advantages.
2. The mountains run generally N and S. in parallel lines; the chief peak is the beautiful cone of Fuji-san (12,400 feet); and the chief range runs down Honshiu (Hondo) from N E. to S W, presenting a full face to the S.E. monsoons. A number of the volcanoes are still active, e.g. Aso-san; and various spurs from the main range descend precipitously into the deep Pacific waters, forming magnificent harbours of refuge.
3. The height of the mountains and the narrowness of the country cause the rivers to be little more than torrents, very few being navigable; and their great force and the friable nature of the volcanic soil cause them to carry down immense quantities of alluvium, which makes the valleys and plains very fertile.

*NB*—The river valleys have greatly facilitated railway development, e.g. from Tokyo to Nagata and from Kyoto to Tsuruga.

2. The climate of the chief islands depends on their nearness to the great continent of Asia and to the Kuro-shiwo or 'Black Stream.'

1. As all the east coast and part of the west coast are washed by the warm waters of the Kuro-shiwo, the fall of rain and snow is considerable; but, as the prevailing wind is northerly in winter and southerly in summer, the warm current does not influence temperature much. The climate, of course, changes with the latitude—to almost arctic extremes in the Kuriles, and to tropical extremes in Formosa.
2. The meeting of the warm current with the cold Kurile current causes dense fogs, especially off the E. of Yezo and N.E. of Honshiu; and the change of monsoon farther south

is accompanied by dangerous typhoons. The effect of the cold current is also seen in the frozen harbours of Yezo, and in the low average temperature in the larger islands compared with other islands in the same latitude, *e.g.* the Azores.

*N.B.*—The cold current is mainly responsible for the enormous supply of fish, and the consequent importance of fishing, *e.g.* at Aomori and Nagasaki. Cf. the export of furs (bear and Aino dog) from Hakodate.

**3** Both the vegetable and the mineral products are very valuable.

1. The characteristic vegetation includes various 'forest' products, tea, camphor, and rice.

The most important 'forest' products are gigantic cedars, the valuable *kiyaki* (the hard timber of which is in great demand in the Nagasaki ship-building yards), *cyprus* (which supplies good wood for furniture and lacquer work), the lacquer-tree itself (which is grown mainly in Honshu north of the Kyoto 'isthmus'), the mulberry (which is very abundant between Kyoto and Hamada, and for many miles north and west of Tokyo), and the wax-tree (which is grown all round the Seto Uchi, or 'Inland Sea').

*N.B.*—The 'leafy' soil suits all kinds of fibres, especially tobacco and hemp. Cotton is grown in the south, but it is coarse and short-stapled.

Tea is a special product of Kyushu and Shikoku, and very large quantities are also grown in the 'elbow' of Honshu, especially round Tokyo—from Kyoto northward to Toyama Bay and southward to Sigu,—and on the forested eastern highlands of Formosa, especially round Tawatutia (suburb of Taipeifu) and Tamsui.

*N.B.*—The quality of the tea depends partly on the distance of the gardens from city smoke and dust.

The same area of Formosa is the chief source of the world's supply of camphor; and considerable quantities come also from the laurel plantations in the south of Kyushu, and along the whole S.E. shore of Shikoku.

The rice comes mainly from the lowlands of the centre and west coast, and the quality causes it to be in such demand in foreign markets that most of it is exported, and a cheaper and coarser quality is imported from the mainland of Asia to supply the food and drink (*saké*) of the people.

*N.B.*—Horticulture (mainly for chrysanthemums, camellias, and dwarf trees) is very important. Cf. the cherry and plum orchards.

2. The characteristic minerals are copper, sulphur, and kaolin—the Ashio copper mines (near Nikko) being the largest in Asia, but the most important are coal, iron, and oil. The

chief supplies of oil come from Echigo, especially from round Takata, Amagase, and Nutsu, and the iron is found mainly in Hoki and Idzumi, especially round Yoneko, in Shinano, especially round Takashima, and in Rikuzen, especially round Sendai.

The chief coal mines are in Yezo and Kyushu. In the former the best mines are between Sapporo and Muroran, where they are very convenient to the great harbour of Hakodate (a fishing centre), and corresponding deposits in the north of Honshu, especially at Hirosaki, are very useful to the Aomori terminus of the trunk railway. In Kyushu the chief centres are Moji and Nakatsu for the Buzen coal (within easy reach of the railway terminus and treaty port of Shimonoseki) and Hakata and Karatsu for the Chikuzen, (within easy reach of the great harbour and fishing centre of Nagasaki), and there is also a good deal of coal round Saga. Cf p 189, § 9 (2) But Japan is *not rich* in coal.

*NB*—Equally good coal is found (in the gold-district of Formosa) near the harbour of Kelung; and there are exports of copper and antimony (especially from Yokohama)

4 As in India, the most typical industries are concerned with the 'hand' production of 'luxuries.'

1. Metal work is a speciality in Tokyo (gold, silver, and bronze) and Osaka (bronze), china in Nagoya (and its 'suburb' of Seto), Kyoto, Osaka, Kagoshima ('Satsuma' ware), and Arita ('Imari' ware) cloisonne enamel in Kyoto and Nagoya, and tortoise-shell in Nagasaki
2. Lacquer work is a speciality in the three large centres (Tokyo, Osaka, and Kyoto) and in a number of towns in the lacquer-tree area, e.g. Yonezawa, Wakamatsu, Obama, and Shizuoka; bamboo ware (screens, mats, etc.) in Osaka and Shizuoka; straw-braid in Okayama, Fukuyama, and Onomichi; fans and toys in Tokyo, Kyoto, and Osaka.

5. The more modern industries are largely concerned with 'necessaries'—partly machine-made.

1. Textiles are much the most important: the insular climate is peculiarly favourable, there is abundance of good coal and 'constant' water-power, the price of labour is low, and the duration of natural light in winter is comparatively long.

The oldest silk centres, Askikaga and Kiru, still produce the finest fabrics, and the towns of Jonessawa, Janagata, and Fukushima are also important. Osaka, Kobe, Okayama,

and Miye are the chief cotton centres, the same district also producing the famous 'Sakai' carpets (cotton, silk, and wool), especially at Sakai. The exposed west coast between Wakasa Bay and Toyama Bay produces all the habutae, especially at Fukui and Kanazawa.

2. Hyogo, Osaka, Nagoya, and Tokyo are the great 'match' centres, candles are the natural product of towns in the wax-tree areas, *e.g.* Yamaguchi, Matsuyama, and Nakatsu, the clocks of Nagoya and the surgical instruments of Tokyo and Osaka are specially fine, glass is made chiefly in Osaka, paper in Nagoya, and tobacco in Kagoshima.
3. Kyoto, the old capital, makes the most distinctively 'Japanese' products, *e.g.* china, umbrellas, fans, dolls, etc.; Osaka, with the water-power of the Yodo-gawa from Lake Biwa, makes the most 'modern' products, especially cotton fabrics and soap, Yokohama, the most 'European' port, handles specially raw silk (the most valuable export of Japan) and tea (more valuable than any other except silk and coal); the double port of Kobe-Hyogo handles rice, curios, bamboo wares, and other distinctively 'Japanese' products; Murogan and Moji are coal ports; Nagata is specially an oil port; and Noshiro specially a lacquer port.
4. A very important part in the development of Japan is being played by her mercantile marine, which has been raised during the war to nearly 2,000,000 tons, while her exports exceeded £160,000,000 by 1918.

## China.

1. THE surface of China Proper is divided into two nearly equal areas by the Yang-tse-kiang or Blue River.

1. The southern area consists of an intricate system of low mountains, running generally east and west, with its greatest height in the Yunnan plateau and its lowest level in the Hunan lake district. The main ridge—the Nanking or Southern mountains—separates the Yang-tse basin from that of the Si-kiang.
2. The northern area may be subdivided into plain and mountains. The plain includes the entire lower basins of the two great rivers—from the Fo-yang Lake to the part of the Great Wall due north of Pekin, the mountainous region is all along and west of the grand southward reach of the Hwangho, or Yellow River, and its main ridge—the Peling or Northern mountains—are a continuation of the Kuen Lun, separating the 'Yellow' from the 'Blue' basin.
3. Some characteristics of these various areas are very important. Thus, much of the plain is so low, and the riverbeds have been raised so much by silt, that floods are very common and terribly destructive, the deep valleys of the N.W. are covered with loess—intensely fertile yellow dust blown from the desert by the 'Yellow' wind in winter; the Peling mountains are an almost complete obstacle to communication between the fertile Wei and Han valleys.

2. The determining factor in the climate is the position of the country in the North-Temperate zone on the east of the largest land-mass in the world.

1. The temperature is one of extremes, increasing towards the north and decreasing towards the sea; and the winter cold is accentuated by the dry N.W. 'Yellow' winds.
2. The humidity depends on the S.E. monsoons which blow inland all through the summer off the warm China Sea, slightly moderating the heat and guaranteeing that combination of warmth and moisture which offers such rewards to agriculture.

3. The alternation of dry and wet seasons has some important results. The dry cold winters maintain the health and energy of the people, and their 'Yellow' winds provide a soil—the loess—out of which none of the fertilising elements have been washed by rain, the warm damp summers offer every possible inducement to agriculture—except a uniform volume in the rivers—and enable some crops to be grown which are generally confined to the Tropics, *e.g.* rice and sugar-cane.
4. The variation in volume, of course, affects the usefulness of the rivers, even if there were no floods. For instance, at Ichang, the head of navigation for large steamers, there is a regular yearly variation of *at least 40 feet* in the level of the Yang-tse, and at Chung-King, the head of navigation for smaller steamers, there is a similar variation.

On the Hwangho—'China's Sorrow'—the variation is equally great and much more destructive. Again and again its course east of Kaifung has been changed—with most deadly effect. In 1852 a single flood moved its estuary 300 miles—from within 100 miles of the Yang-tse to its present embouchure into the Pechili Gulf, in 1887 its banks were burst again at the same place by a gigantic flood which drowned *at least one million* persons!

5. The change of monsoons has another disastrous effect in the typhoons, which always move westward and poleward from the centre of damp, hot, calm air that gives them birth; and which, therefore, make navigation off the S.E. coast of China exceptionally dangerous.

3 The chief occupations in China are agriculture and fishing, the Chinese being the most distinctively agricultural people in the world.

1. The soil is very fertile and magnificently cultivated—by hand. 'Hand'-cultivation, of course, implies that the holdings are very small—even cotton being grown only in 'garden-patches'; and this is one reason (cf. the very dense population) why China exports so little food-stuff.
2. The agricultural products include rice, sugar-cane, wheat, beans, tea, mulberries, opium, bamboo, oranges, cotton, cassia, etc.—a mixture of products only possible in a very large and very fertile 'monsoon' area.

The rice and sugar-cane are characteristic of the hottest and wettest parts, *i.e.* the low southern swamps, the sugar-cane being specially productive in the Si-kiang basin and



in the island of Hainan, wheat and beans are characteristic of the drier low lands, and the northern and western plains.

The tea-silrub and the mulberry are the most important of all plants for foreign trade. The tea is a special product of the S.E. mountains, the gardens in Che-kiang producing mainly 'green'-tea, while quantities of 'brick'-tea are exported to Tibet from Suchwan, and the Song-ka valley produces the 'Puerh'—the finest of all China teas. The mulberry does best in the Yang-tse valley, especially on the delta and in Suchwan (cf. 'Cheng-tu' silk), and in the Si-kiang valley, especially S.W. of Canton. Tasar (*z.e.* wild) silk is also collected from the northern forests, especially in Hunan and Shantung, and from the forests of Kwei-chow.

Opium and bamboos, like oranges and cotton, are grown almost everywhere; but opium is a special product of the upper Yang-tse, especially in Suchwan and Yunnan,—bamboos are a special product in Kwang-tung,—and cotton is a special product of the Po-yang and Tung-ling basins (where the cotton-seed oil is in demand for lamps). It is also displacing opium everywhere.

*N.B.*—Cassia is a special product of Kwang-si, as the wax-oak is of Suchwan, and Indian ink of Nganhwei, and as drugs are in Hunan.

3. The fisheries are exceedingly important, both inland and along the coast. It is said that 40,000,000 Chinamen make their living by fishing—with every kind of line and net, by day and by night, and with every imaginable device and decoy, animate and inanimate.

4. China is remarkably rich in minerals, especially coal, but they are not much developed.

1. The largest known coal-field in the world is in the S.E. of Shansi, and it is of exceptionally good quality. There is another large field, of inferior quality, in the W. of Shansi, and there are valuable deposits in hills west and east of Peking—in the west of the Shantung peninsula—and in the south of Hunan, the last having very easy access to the Yang-tse *via* the Siang.
2. Shansi is also very rich in fine iron, limestone, and potter's clay; and the latter is also a special product of Kiang-si. Copper is found in great abundance in the Meling and Yuling mountains, and also in Yunnan, Suchwan, and Hupe; and, as these three areas are also rich in tin, they have been famous for centuries for their bronze work.

*N.B.*—Salt is also produced in huge quantities in Suchwan.

5. The staple industries are exceedingly old, and yet very backward.

1. The absence of machinery, and the objection to the division of labour, are the great drawbacks, but the manual skill is very great, and the density of the population reduces wages.
2. Silk has been manufactured for thousands of years, and still is the most important product—Suchou, Hangchau, Wuchang, Ningpo, and Nanking being the chief centres, cotton and rhea (ramie) are manufactured specially round Shanghai, but Wuchang and Nanking (cf *nankeen*) are also important centres, and the Lien-chou peninsula is famous for matting.

*N.B.*—There are 'modern' cotton *mills* at Shanghai, Ningpo, Wuchang, etc.

3. Industries in bean-cake, straw-plait, and drugs are very closely connected with local agriculture, and are very widely spread; but Siangtan and Changsha are specially famous for drugs, as the district between Tsinan and Ichou is for straw-braid. Tobacco is a special product of Lanchou, and opium of Yunnan; and paper is made almost everywhere (straw-paper being made particularly for use in fireworks).
4. The—as yet undeveloped—mineral wealth of Shansi ('West Mountains') supports various metal industries in Taiyuen—very fine copper work is produced round Yunnan and Cheng-tu and round Kwei-lin, and bronze in the same places and round Hankow; Hankow and Hanyang have also the chief iron works, though the commanding position of Shanghai makes it famous for naval and military plant; Canton is famous for stone and other carved work; and Kingtechen is the chief centre of earthenware and the sea of the Imperial porcelain works.

6. The general development of the country is greatly impeded by want of, or cost of, transport.

1. The one great natural waterway is the Yang-tse, and this accounts for the importance of—Shanghai, the outlet for all the Yang-tse valley and the entrepôt for all Northern China,—Chinkiang, at the lowest place on the Yang-tse which is at all fit for a great harbour, and which commands the junction with the Grand Canal,—Nanking, at the last defile through which the river breaks,—Hankow, the greatest waterway-junction in China,—Ichang, the head of navigation for large steamers,—and Chungking, the head of navigation for small steamers.

2. The Grand Canal from Hangchau to Tientsin (the port of Peking) is the most important of the artificial waterways; and railways are spreading rapidly. From Peking lines radiate to Mukden, Kalgan, Taiyuen, Hankow, and Nanking, and from Shanghai to Nanking, and Ningpo, while important lines run from Laokai to Yunnan and from Tsingtau to Tsinan. The Manchurian lines total 1600 miles, and there are several short systems elsewhere, *e.g.* round Canton. Among important junctions are Harbin, Mukden, Newchwang, Tientsin, Tsinan, and practically Nanking and Hangchow.

7. The character of the coast, however, produces some very fine or very convenient ports.

1. Canton stands at the west of a line of hills, commanding all the trade of the densely-peopled Kwang-tung province, with navigation for ocean vessels up the Canton or ('Pearl') river to the heart of the city, and for river steamers up the Si-kiang (or 'west') river, up the Tung-kiang (or 'east') river, and up the Pe-kiang, (or 'north') river. In olden times, it was also the only Treaty Port, and is still the chief silk port. (Cf. Kwang-si mulberries), as Hankow is the chief tea port.

*N B*—About 300,000 of its inhabitants live in boats

2. Hong-kong is a granite rock about the size of Holyhead; but, with the British strip of Kowloon on the mainland, it shuts in one of the most magnificent harbours in the world—Victoria.

*N B*—The neighbouring island of Macao (Portuguese) is a centre of the opium trade *via* the Si-kiang valley from Yunnan, the chief poppy-growing province, and, like the dependent islands of Taipa and Coloane, it has an important fishing industry

3. Fuchou and Amoy do a large trade in 'black'-tea (cf. the Fokien tea-gardens), and Hangchau and Ningpo do a large trade in silk.

### Sino-Japanese 'Dependencies.'

1. MANCHURIA is a grassy plain which produces fine crops of millet and soya-bean.

1. Mukden, with a coalfield at Fushin, commands the 'neck of approach' up the valley of the navigable Liao, *i.e.* *via* New-

chwang. Tsitsihai is at the head of navigation on the Nonni, and, as long as the Amur is unfrozen (June to November) there is excellent navigation to Aigun. Kirin is at the head of navigation and the centre of salmon-fishing on the Sungari; and the parallel Usuri valley commands the railway to Vladivostok. Newchwang and Dairen are the two chief ports, the latter never being frozen.

2. Mongolia, which professes now to be independent, is a dry dreary plateau, occupied by scattered herdsmen.

1. It is divided by the Altai ranges into two fairly equal areas, and an enormous proportion of both is filled up with the Gobi or Shamo ('sand-sea') desert.

2. Two trade routes run across the northern area from Peking *via* Kalgan—to the chief town, Urga, and the frontier market, Maimachin ('Trade City'), for Kiakhta and Irkutsk, and to Uliasutai and Kobdo.

3. Like Mongolia, Eastern Turkistan is divided into two areas by a mountain range—the Tian Shan—and includes a large area of desert—the Tarim.

1. The small north area—Dzungaria—gives the easiest overland route from China to Europe, *via* Barkul, Urumtsi, and Kulja.

2. In the much larger southern area—Kashgaria—all the chief cities are situated on irrigated oases, either on the banks of streams from the encircling mountains, *e.g.* Kashgar, Yarkand, Khotan, Karashar, or round wells, *e.g.* Kanchew, Ansifan, Khami; and the climate and fertile loess produce such enormous quantities of fruit (peaches, apricots, grapes, etc.) that the bulk of the people live on fruit during the season.

3. Kashgar, on one of the chief head-streams of the Tarim, with the Terek-Davan and Terek-Ti passes behind it, commands the trade with Russian Turkistan; it is also the political capital, and weaves cloth out of the very fine wool. Yarkand, on the other chief head-stream of the Tarim, commands the Karakoram pass *via* Karghalik into Kashmir, and—like Khotan—has valuable deposits of jade, and a large leather trade (boots, saddlery, sheepskin coats).

4. The dreary lake-strewn, mountain-ribbed plateau of Tibet is the highest continuous area on the face of the earth, it is also probably the most priest-ridden.

1. The bulk of the people live in the Sanpu or upper Brahmaputra valley, where most agriculture is possible, and the capital Lhasa, ('God's Throne'), stands on the north, *i.e.* the sunnier, slope of the valley. The wealth of the country is at present limited to wool or hair (from the yak, the goat, the native sheep)—musk, especially in the Kuku Nor district,—and rhubarb, especially round Tachien-lu, the commercial and strategic gateway of the plateau—with some gold, borax, and salt. The food of the people is buttered oatmeal porridge, cheese, and 'brick'-tea (mainly from Ya-chou).

*N.B.*—Foreign trade is conducted mainly *via* the Yang-tse, or the Indus (to Leh), or Yatung, Gyantze, and Gartok (to Daryling). Lhasa and Shigatze are the chief internal centres, Chinese traffic coming *via* Batung.

5 The rich valleys of Korea, with their peninsular climate, mark the transition, in political development as well as in geographical features, from China to Japan—to which Korea now definitely belongs.

1. The coast-line resembles somewhat that of Great Britain—being bold and rocky towards the ocean (E. side), but low and sandy towards the continent—with heavy tides on the west and light ones on the east, and with a number of adjacent islands, *e.g.* Quelpart, which breeds ponies. Cf. the Shetlands.
2. The surface also has some resemblance to that of Great Britain—being about the same size, and having a water-parting running down it from N. to S., much nearer the ocean coast than the continental (W. side).
3. Seoul commands the head of the chief river-valley; its port, Chemulpo, obviously controls sea trade with China—largely in ginseng root; and the rail terminus of Fusan obviously controls the trade with Japan. Wonsan is mainly a mineral port, with a considerable export of gold. Among the other ports are Chinnampo and Masampo, while Ping-Yang, Wiju (Antung), and Anju are inland centres.

*N.B.*—Rice, beans, and ginseng are exported; and the country is rich in minerals (including coal and iron) and in fibres (especially cotton). Excellent paper, tobacco, and hemp cloth are made.

4. In the north, where the persistent N.W. winds make the winter very cold, the country is rich in fur-bearing animals, *e.g.* the Korean 'tiger,' the fox, squirrel, etc.

## Asiatic Russia.

1. THE sub-divisions of the Russian lands in Asia are mainly river-basins—one of inland, and four of oceanic, drainage.

- 1 The Turan, or Aral-Caspian, inland drainage area is very low—in some places, below sea-level, and both its lakes and its rivers are drying up, although some of the rivers, *e.g.* the Amu, flow from the Pamir, and others, *e.g.* the Syr, from the Tian-Shan. Their value for irrigation is immense.
- 2 The Siberian oceanic drainage area is naturally divided into two parts—western, or lowland, and eastern, or highland. Throughout the north there is an expanse of ever-frozen tundras, caused partly by the flooding of rivers the upper course of which is freed from ice long before the lower; and below the tundras there is a belt of forest, which yields timber and shelters innumerable fur-bearing animals, *e.g.* the sable, ermine, etc., and innumerable squirrels. All the rivers are rich in fish, *cf.* the great fish-market of Tobolsk; and the easterly rivers, especially the Anadyr, are exceedingly rich in salmon, *cf.* the Alaskan rivers.
- 3 The climate is essentially continental, with very great extremes, which increase from west to east, the want of protection from N winds, and the want of access for S. winds, make the cold intensely severe, and the wide expanse of low level causes atmospheric disturbances to spread with remarkable rapidity. Unfortunately, too, the reckless destruction of timber in the forest zone—the only protection along the north—is increasing the dryness.

2. Russian Central Asia is largely desert except towards the extreme east and the extreme south

- 1 Its typical feature is the luxuriant vegetation which marks the oases and the banks of the rivers, and this may eventually justify, on commercial grounds, the construction—for political reasons—of the *Trans-Caspian Railway* from the port of Krasnovodsk to Merv for Tashkent and Kushk.

*N.B.*—This 'desert' railway is protected from drifting sand by miles of saxaul hedge.

2. The typical products are grain, fruit, fibres, and animals. Cattle, sheep, horses, and camels are raised on all the oases; the Fergana plain is specially famous for cattle, the province of Khiva for camels and sheep, and the south of Trans-Caspia for camels and horses

Fibres are exceedingly important, especially cotton, which is raised in very large quantities in Fergana (American 'upland' variety), Khiva (native), and Bukhara, and round Merv. Hemp (mainly for *Bhang*) is raised largely along the Murghab, Heri Rud, and Zerafshan; and tobacco along the Zerafshan and the Daria.

*N.B.*—Silk is also raised largely in Fergana and Bukhara.

Enormous quantities of fruit are grown, especially round Tashkent and Bukhara and all kinds of grain, especially wheat, are grown in Fergana, where the railway from Samarkand to Andijan gives special facilities for transport.

- 3 The typical manufactures are textiles, leather, and weapons. Tashkent makes all kinds of textiles, shagreen, knives, and firearms; Bukhara, Kokand, and Margelan make cotton and silk goods, and Bukhara is famous for its ornamental leather and steel-work; Khiva makes mainly cottons and woollens; Kara-Kuh is a special centre for 'astrakhan'

The places where the railway crosses the most important rivers, *e.g.* Chinaz and Charjui,—the various termini, *e.g.* Tashkent and Andijan,—the chief junctions, *e.g.* Merv and Khavas,—and 'frontier' stations, *e.g.* Askhabad and Kushk, are points of great and growing importance.

### 3. Siberia may be divided into three main areas.

1. The lowlands between the Urals and the Yenisei, south of the sub-arctic forests, produce vast quantities of grain, especially wheat, the 'black-earth' district of Russia extending into Siberia as far north as Tobolsk, and as far east as Tomsk. The product is greatly in demand in the Altai and Ural mining areas and in the Kirghiz Steppes; but, as there is water transport during the short summer over some 9000 miles of the Ob system—*e.g.* from Semipalatinsk to Tyumen *via* the Irtysh and the Tura—surplus supplies will be able to reach foreign markets cheaply. There has been a very important development of the dairy industry in the area between Kurgan, Omsk, Petropavlosk, and Barnaul, thousands of tons of butter being exported every year mainly *via* Riga and Windau.

2. The highlands between these lowlands and the Yablonoi-Stanovoï water-parting are very rich in minerals, including mammoth ivory along the northern Lena and in the Liakhov Islands, and the graphite of Aliberg; but the special product is gold. The Altai and Sayan goldfields, which are the richest, have easy transport in summer *via* the Yenisei and Ob systems, and contain also silver and lead, jasper and serpentine, salt and saltpetre. Irkutsk, the capital of Eastern Siberia, is much the most important centre; it is a rail and lake junction. Krasnoyarsk, where the line crosses the river at the head of navigation, is the centre of trade with the Yenisei gold area, and Udinsk is the main outlet westward for the 'Baikal' mining district.
3. The most important part of Trans-Baikalia is the eastern watershed of the Yablonoi Mountains, for the eastern course of the Amur gives special facilities for the expansion of Russia towards the Pacific, and the climate is much more favourable to agriculture than in the Baikal basin. Chita, the capital, commands the water-parting; Nerchinsk is the centre of a great mining district (precious metals, copper and iron, lead and mercury), which stretches as far as Strelensk; and Khabarovsk is the northern terminus of the Ussuri valley railway to Vladivostok.

Vladivostok is a very important railway terminus on a bay which is ice-free for almost all the year, and which is kept open for trade—by ice-breakers—even during the depth of the winter, but it cannot compare with the ports on the Liao-Tung peninsula which Russia lost during the recent war. Dairen, for instance, is one of the finest deep-water harbours on the Pacific, and never ice-bound.

4. The great length of the *Trans-Siberian Railway* (5400 miles from Moscow to Vladivostok), and 'strategic' modifications of the best economic route, hamper its use for such typical, bulky products as wheat and timber, but butter can bear the heavy freightage, *e.g.* on the line from Nikolaïevsk to Barnaul and Semipalatinsk, and aeroplane and 'wireless' are greatly encouraging the Kara sea route to the Ob and Yenissi.



## The East Indies.

1. THE East Indies consist of two archipelagoes divided by 'Wallace's Line' from Lombok Island *via* the Macassar Strait to the S E. corner of Mindanao

1. The islands to the N W of this line are generally said to be Asiatic; those to the S E of it are said to be Australasian
2. The climate is everywhere tropical—hot and damp, and the Philippines are also within the typhoon area; the soil is very largely volcanic, and—under the heavy and constant rainfall—vegetation is exceedingly luxuriant.

*NB*—Except the Philippines, British Borneo, and Portuguese Timor, the area is entirely Dutch

### 2. The Philippines are typical volcanic islands.

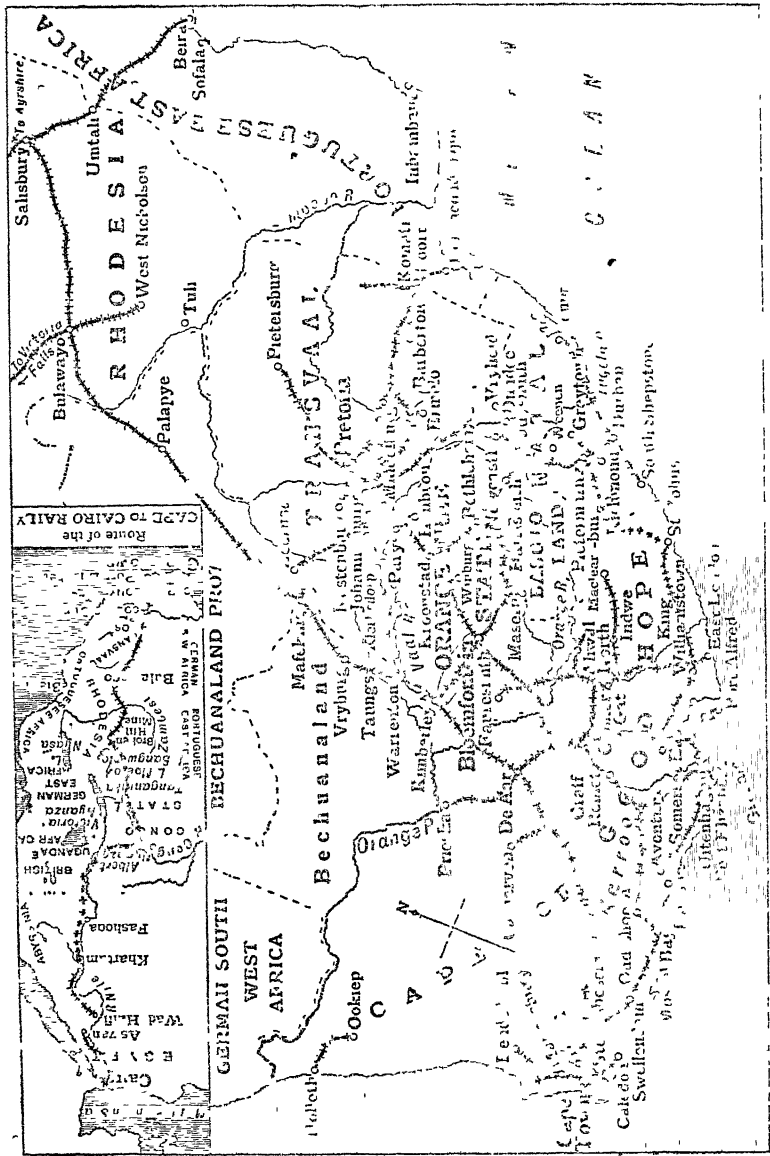
1. The low lands along the coast and in the narrow valleys produce large quantities of Manila hemp, sugar, and tobacco, and the shores are lined with coconut palms. Rice and tropical fruit are also important. The best tobacco is grown in the Cagayan valley (*z.e.* the least tropical part) of N Luzon, but is shipped from Apari to Manila for manufacture (mainly into cigars and cheroots), the best copra is shipped to Marseilles (for soap)
2. The mineral wealth is considerable, but undeveloped. It includes gold in N. Luzon and Catanduanes, copper in the same area of Luzon, in the Camarines district, and in N Mindanao, especially between Butuan and Surigao,—iron near Manila, in Panay, and in Cebu,—and coal in S. Mindoro, in the Dumaguete district of Negros (along with petroleum), in Cebu, and Samar, and in the extreme S W. of Mindanao, especially near Zamboanga
3. Manila monopolises all the industries (cigar-making, sugar-refining, and distilling) and most of the commerce, for which it has peculiar advantages in its magnificent harbour and in its position with regard to the mainland of Asia; but Cebu ships a good deal of sugar, and Iloilo a good deal of hemp.

3. The Dutch islands have very valuable exports of coffee and sugar,—tobacco, cinchona, tea, and indigo.

1. Though not the largest island, Java (=England) is the most important because it is the most fertile, the most densely peopled, the most highly cultivated; it is also the most volcanic. The only good port on the bold south coast is Tjilatjap; but on the low north coast Batavia has a fine harbour at Tanjong Priok, and the Surabaya estuary is well sheltered by Madura. The dangerous roadstead of Samarang, the nearest port to the great native capital of Surakarta, has oil industries.
2. As Sumatra has its narrow mountain chain running close along the S W coast, there is room for large placid rivers on the N E plains. Its special products are tobacco, *eg.* from Deli and Ranau, black pepper, *eg.* from Telokbetong, coal from behind Padang, gold and petroleum from round Jambi and Palembang, and immense quantities of tin from the dependencies of Banka and Billiton. The native filagree work (gold and silver) is very fine.
3. As Borneo is crossed by the equator, it has, like Sumatra, 'two sets of seasons'; but, unlike Sumatra, it has no volcanoes. It has a large amount of low level land threaded by navigable rivers and covered with rice. Dutch Borneo exports tobacco, sugar, pepper, edible nests, sea-slugs, and gutta-percha—the last mainly from the large port of Pontianak, and the chief town, Banjarmasin, is famous for its knives and basket-work. The British area produces excellent camphor, tobacco, and coal—the latter from both Borneo and Labuan; coffee and pepper are also cultivated, and gold and diamonds are found. Such curiosities as edible-nests and sea-slugs are collected for the Chinese merchants in Sandakan and Kuching. Brunei and Sarawak export specially cutch and sago.
4. The only parts of Celebes effectively occupied are the Macassar and Minahassa peninsulas. Its special products are macassar oil (a tree sap), tortoise-shell, sea-slugs, pearls, spices, and coffee. Macassar is the most important native mart in the whole archipelago.

*NB*—The Minahassa coffee is exported from Menado during the east monsoon, but from Kema during the west.

5. The Moluccas, or Spice Islands, export nutmegs from Lons; the Amboina group is famous for cloves, and the Banda group for nutmegs, Ceram exports sago.



## AFRICA.

1. AFRICA has less benefit from its surroundings than any other continent.

1. Owing to the extraordinary simplicity of the outline, it has less coast for its size than any other continent ; and, therefore, the interior enjoys neither the commercial nor the climatic advantages of the sea.
2. The want of bays, gulfs, and inland seas is not the only disadvantage of the coast , hundreds of miles are backed by desert, and hundreds are skirted by malarial swamp. There are also very few islands ; and those which really belong to the continent, are of very little value
3. Again, the winds and currents of water are not very favourable. In the west the Benguela current is cold, and the natural course of the 'Trades' carries them away from the shore ; in the east the N E Trades blow for only half the year, and the S E are dried in crossing the mountains of Madagascar.
4. In the summer the intense heat of the Sahara draws the 'Etesian' winds inland from the Mediterranean, and S W. monsoons inland from the Gulf of Guinea , but the Mediterranean is too narrow to saturate any winds that pass over it, and the monsoons blow partly off the cold Benguela current.

*N B* —It is the meeting of this cold current with the warm Agulhas current that causes the frequent fogs and storms off the Cape of Good Hope, which was originally called the Cape of Storms. Cf pp 131 and 208

2. The whole continent is an enormous plateau subdivided into a number of smaller plateaus.

1. There are no huge low plains or high mountain ranges, like those of Asia and America, but the whole mass has a more

- or less uniformly high level, rising suddenly from the coast in terraces to a saucer-shaped depression inland
- 2. The plateaus are higher in the east than in the west, reaching in Kilima Njaro and Kenia a height of 18,000 to 19,000 feet, *i.e.* half a dozen times as high as Helvellyn or Ben Lomond. This eastern ridge of the plateau consists mainly of very old rock, and may be called the backbone of the continent
- 3. Its highest ridge runs almost due north and south, following a line of volcanoes, extinct and active, the chief peaks of which are those of Kilima Njaro and Kenia; and there is a similar ridge farther west, the highest peak of which is Ruwenzori (16,700 feet). Between each ridge and the general surface of the intervening plateau there is a corresponding line of deep valley; and the whole area between the ridges is full of lakes, some of which are broad, *e.g.* Victoria Nyanza and Lake Tsana, whilst others are long and narrow, *e.g.* Lake Nyasa and Lake Tanganyika.
- 4. The western half of the peninsula is almost entirely occupied by the huge basin of the Congo, which, like that of Lake Chad, is one of the typical saucer-shaped depressions of Africa. It is enclosed almost everywhere by the typical plateau rim, and owes its volume of water partly to the narrowness of the peninsula in the latitude of Zanzibar, *i.e.* the point to which the N.E. Trades reach in winter.
- 5. The presence of heights on or near the edge of the plateau has greatly affected both climate and inland communication. All these heights have comparatively heavy rainfall on their seaward slopes, and prevent rain from being carried inland, all the rivers are spoilt by cataracts, many also by steep banks, and the difficulties of river navigation increase the need for railways, to the construction of which the 'mountain' rim is a great obstacle

*N.B.*—The coastal strip is very seldom more than 300 miles in width, and generally much less. The Atlas is the only real mountain range. Cf p. 234

3. The East Coast system is by far the most important part of the mountain system.

- 1. The Southern section runs from Cape Town to the Limpopo under various names, *e.g.* Nieuw-veld, Sneeuw-Berge, Storm-Berge, Draken-Berge, and it varies in height from about 6000 feet in the Nieuw-veld to nearly 8000 feet in the Sneeuw-Berge, and about 11,000 feet in the Draken-Berge
- 2. The Central section consists of the eastern buttresses of the East Equatorial plateau, and its characteristic feature is the

series of huge volcanic peaks which overlook the Great Lakes at a height of 16,000 to 19,000 feet, *e.g.* Ruwenzori, Kilima Njaro, and Kenia

3. The Northern, or Abyssinian, section has no peaks above 15,000 feet, but no other equal area in Africa has such a great average height as Abyssinia. Cf. Tibet
4. The African rivers fall into two classes—coastal and continental.

1. The coastal rivers are those that rise on the steep seaward slope of the huge plateau-formation of the continent, and, as the slope is almost everywhere very near to the sea, they are generally too short and far too rapid for navigation.
2. The continental rivers are those that rise on the landward slope of the 'mountains' which buttress the plateau, and, as this slope is almost everywhere very slight, they are generally very much longer than the coastal rivers, and extremely valuable for navigation
3. The nearness of their watershed to the sea causes the coastal rivers also to flood so suddenly and violently that they plough very deep channels, which greatly lessens their value for irrigation, and the difficulty of cutting through the uplifted rim to the sea causes the continental rivers to be terribly obstructed by falls and rapids.
5. The Congo, like the Amazon, has a large basin which includes an area of constant equatorial rainfall.

1. No other rivers in the world combine these two advantages. In each case the great area of the basin gives room for a huge number of tributaries. In each case, too, the constant heavy rainfall accounts for the enormous volume of water.
2. The Middle Congo is a magnificent waterway of nearly 2000 miles in length between Nyangwe and Leopoldville. Near Nyangwe it drops on to a great forest-clad plain, and at once broadens out to about a mile in width, just on the Equator navigation is completely stopped by the Stanley Falls, where the river again drops to a lower level
3. Below Stanley Pool, in order to force its way to the sea, the Lower Congo has to compress itself into the winding channel of the Livingstone Rapids. Ocean vessels can navigate the 100 miles up to Vivi, though most of them stop at Boma, and the 88 miles between Isangila and Manyanga are navigable; but the 50 miles from Vivi to Isangila is a

- series of boiling cataracts, and the same is true of the 85 miles from Manyanga to Leopoldville

*N B*—The mud is carried out into the Atlantic for 300 miles

- 4 The most important part of the whole river is the 1000 miles of unbroken navigation between Stanley Falls and Stanley Pool. Between these two points the river broadens out from 15 to 20 miles in width, and is joined by at least twenty magnificent tributaries, including the Aruwimi from the dense forests below Mount Ruwenzori. Consequently, thousands of miles of waterway converge on Stanley Pool, giving access in various directions to an area a dozen times the size of Great Britain, the whole is rich in palm oil, rubber, and ivory, and there is now *through* steam communication by rail and river from Banana to Dar-es-Salaam.

6. The Nile is the longest river in the Old World, but, as a river, it cannot compare with the Congo.

1. Egypt has been called 'the gift of the river,' and the name is significant of the part played by the Nile in the history of the country. Politically, the Nile is the bond between Egypt and the Sudan, and its great eastward bend puts Berber into direct political relation to Sawákin. Commercially, it is the one highway northwards from the Equator to the Mediterranean, its current is always strong enough to carry a boat down stream, and from April to October the Etesian gales blow steadily up stream.
2. The Blue, or 'Muddy,' Nile, like the Luapula (Congo), is the eastern branch, and flows at first southward from Lake Tsana, as the Luapula does from Lake Bangweolo.
3. Like the Congo, too, the Nile is terribly spoilt by hostile climate and physical obstacles. The climatic difficulty, however, is desert, not fever-haunted forest; and the obstacles are in the middle, not the lower, course. For instance, in the 1500 miles between Alexandria and Berber, where the Nile enters the desert, not a single permanent tributary joins the river, and between Khartum and Assuan there are as many as six cataracts, which more or less hinder or actually stop navigation.
4. On the other hand, the Lower Nile provides 800 miles of unbroken navigation outside the Tropics toward the great markets of Europe, and the fertilising mud brought down by the Blue Nile and the Atbara is deposited along the banks of the river instead of being carried out to sea.

7. The commercial and political importance of the Niger to the Sudan is immense.

1. The hills in which it rises, have one of the heaviest rainfalls in Africa, which accounts for the river's volume; and the lowness of the watershed accounts for the comparative absence of cataracts except near Rabba, where the river breaks through the West Coast 'Range' to the sea.

*N.B.*—The proximity of the desert, as in the case of the Nile, accounts for the deficiency of tributaries

The main stream commands the Western Sudan, and its Benue tributary commands the Central Sudan, as the Nile commands the Eastern Sudan. It also commands a huge area of tropical forest, which must be of untold value, quite apart from the value of the river itself as a highway of commerce. Consequently, the Niger, like the Nile, is the centre of some very difficult political problems, and, like the Congo, it will be the centre of an enormous and most valuable trade.

8. The Zambesi is much the most important river along the east coast, especially to Europeans.

1. It gives access to the high-level lake region, which is much the healthiest part of Tropical Africa, and therefore the part of most value to Europeans; and this region also connects the Zambesi with the Nile, *via* the Stevenson Road and the Great Lakes
2. The obstacles to navigation are mainly the silting up and shifting of all the delta channels except the Chindé, the dangerous rapids at the edge of the plateau above Tete, the 50 miles of the Murchison Rapids on the Shiré, and the wonderful Victoria Falls, where a mile's width of water drops suddenly 400 feet into a chink of 100 yards in width.

9. The various lakes are of two classes, of which the fresh-water ones are much the more important.

1. All the most important, *e.g.* the Victoria Nyanza and Lake Tanganyika, lie along the continental axis of the high eastern plateau, where they form large reservoirs for the great rivers, especially the Nile. The less important ones, *e.g.* Stanley Pool and Lake Delu, are simply expansions of the great rivers, and are common in the Niger and Congo basins, where they are very useful in regulating the currents and controlling floods.

*N.B.*—They play an important part in trans continental trade-routes, *e.g.* only railways between Stanleyville and Lake Albert and between Defile and Rejaf are needed to complete the steam 'Cape to Cairo' route.



2. The Victoria Nyanza, the largest fresh-water lake in the world except Lake Superior, is nearly as large as Scotland ; its circular basin is about 200 miles across, and has gently sloping sides; its chief outlet is the Somerset Nile. Lake Tanganyika has not quite half the area of the Victoria Nyanza, but it is the longest fresh-water lake in the world ; it runs in a deep, steep-walled trench for nearly 400 miles, and any surplus waters escape into the Congo *via* the Lukuga. Lake Nyasa, which is similar to Lake Tanganyika both in shape and shores, though smaller, is still twice the size of Lake Ladoga (= Wales) ; it discharges its surplus into the Zambesi, *via* the Shiré. Like Tanganyika, it fills up part of the Great Rift Valley of East Africa.
3. The larger of the saline lakes, *eg* L. Chad and L. Ngami, are naturally in the heart of the continent along the Tropic edge of deserts. They vary immensely in size according to the season, and, when full, they are useful to commerce.
10. The climate depends mainly on the particular amount of moisture carried inland.
  1. The Trade Winds, of course, blow only to the east coast and practically within the Tropics, the N.E. Trades deposit about 100 inches of rain every year at Mombasa, and the S.E. Trades deposit a similar amount at Tamatave—both blowing off a very warm ocean.
  2. The Anti-Trades, on the other hand, can blow only to the west coast and outside the Tropics, and therefore they can reach only the north-west and south-west corners of the country ; the south-westers deposit 50 inches of rain in parts of Marocco, and the north-westers do the same behind Cape Town, but both are prevented by mountains, *eg* the Atlas and Table Mountain, from penetrating inland.
  3. The great heat of the Sahara in summer causes a S.W. monsoon to blow inland off the Gulf of Guinea ; but the latter is not so warm, and therefore does not evaporate so much water, as the Indian Ocean. There is also a S.E. monsoon in early summer off the Indian Ocean.
  4. As each Tropic in turn is for half the year the centre of a belt of 'high-pressure' calms, no regular supplies of moisture can be carried to it during that half, and, therefore, the one Tropic is marked by the Sahara, and the other by the Kalahari Desert. Cf the Australian and Chile Deserts.
  5. The narrow triangular peninsula naturally gets a much larger proportion of rain than the broad continental oblong, and therefore has much more forest and much less desert.

For the same reason it is also much more unhealthy except up on the plateaus.

**11.** The Temperate regions of the extreme north and the extreme south have very similar climate—with winter rains—and produce very similar plants.

1. For instance, the vine flourishes as well in Algeria as in Cape Colony, the pastures of Maiocco produce as good wool and mohair as the Kairros, the forests on the seaward face of the Atlas correspond to those on the seaward face of the Storm Berge; and the semi-desert alfa (esparto) of Algeria and Tunis has its counterpart in the heaths of the Orange basin

**12** The Tropical vegetation varies immensely—with the rainfall, the oil-palm and cacao being very important.

1. The desert and semi-desert regions have a very limited flora of their own—various species of mimosa and acacia being most common, and the date palm being the most valuable.
2. In the low West-Equatorial region, where heat and rain are evenly distributed throughout the year, there is typical 'Tropical' vegetation or 'wet jungle'—dense forest, with the oil palm and various creepers which yield india-rubber.
3. In the high East-Equatorial region, the typical formation is the savanna—wide stretches of grass, with or without trees, and the typical tree is the euphorbia or the baobab.

**13** The whole continent may, therefore, be roughly divided into seven natural regions.

1. The Mediterranean region produces the olive, the fig and the vine, and—in the drier areas—large quantities of alfa, which is exported mainly to the French paper mills. The rainfall, as in South Europe, is practically confined to the winter and spring.
2. The Sahara region produces the date palm, and supplies sufficient pasture for the various nomadic tribes—Hamitic and Semitic—whose nomadic habits are the result of their wanderings in search of pasture. Except in a few specially favoured places, the pastoral wealth is limited to camels, because, as the region is almost rainless, the vegetation is generally limited to plants with leaves so small, or so leathery, or so thorny, that there is little evaporation from their surface, *e.g.* gum-acacias and tamarisks Cf p 239.

*N.B.*—There are also plants which store water in bulbous roots,

3. The soil and climate of the continental Sudan admit of both pasture and agriculture—the ruling Hamitic race being devoted to cattle-rearing, while the subject Negroes cultivate duria and other plants, especially cotton.
4. The Nile valley forms naturally a separate region, dependent for moisture on the annual inundation of the river ; and its resources are almost entirely agriculture, especially cotton wheat, and pulse Its most typical native plant is the papyrus, which grows round lakes and along sluggish streams. The cotton is of very fine quality.

*N.B.*—The average rise of the Nile is 24 feet, less than 22 feet is not sufficient, and more than 26 feet does great damage

5. Western Equatorial Africa, with its intense humidity and even heat, is the home of the pure Negro and the anthropoid apes. The high even temperature and the constant rain make it a region of dense forest, with dark tangled undergrowth, among its most valuable plants are the oil palm, the banana, the ebony, the coffee-shrub, and various rubber-producing creepers The kola-nut is very important.
6. The Great Eastern Plateau consists largely of savannas, the home of 'big game,' and equally suitable for pasture or agriculture. The facilities for pasture tempted the Hamitic nomads to expand southwards over the plateau; the western savannas produce, under Negro cultivation, large crops of millet, cassava, or other food-plants; and Europeans have introduced coffee The year is divided into dry and wet seasons, the height allows European settlement.
7. The extreme south reproduces more or less the conditions of the extreme north, with the same contrast of semi-desert pasture inland and agriculture along the coast Sheep, goats, and the vine flourish in both areas; but in the south the ostrich replaces the camel, and maize and tobacco replace the olive and the fig The maize is becoming of very great importance, and is of fine quality.

14 The characteristic fauna of Africa may be roughly classified under three heads.

1. The desert regions produce the camel and the ostrich, and in Egypt there are also many varieties of aquatic birds, *e.g.* the stork, pelican, and flamingo.

*N.B.*—The desert fauna, *e.g.* camels and sheep, reproduce in their colour the usual tint of the sand, they all have the great length of limb typical of beasts which have to cover long distances in search of food; and they all have some means of storing food or water (*cf.* the 'fat-tailed' sheep).

2. The West-Equatorial forest region is unfavourable to general animal life, but is the home of the gorilla and the chimpanzee, the elephant and the hippopotamus
3. The Great Eastern Plateau has an abundance of large animals, including the lion and the elephant, the giraffe and the zebra, the crocodile and the rhinoceros; and 'big game' are generally attended by the dreaded tsetse fly.

*NB*—The animal products include, therefore, ivory, ostrich-feathers, and skins. North and South Africa also export wool, and Madagascar and West Africa export wax. Immense numbers of cattle are kept on the two great savannas, but there is as yet no export.

**15.** The mineral products include coal and iron, gold, copper, diamonds, and salt.

1. Coal has been found in the Zambesi basin, but is scarcely worked, except in Natal, the Cape, and the Transvaal.
2. Lion is known to exist in considerable quantities over most of Tropical Africa, and there are rich deposits of it in the Atlas Region. It is worked mainly in Algeria, and is exported, *e.g.* from Benisaf.
3. Gold is exported from South and South-East Africa, and from the Gold Coast, and the deposits in the south-east are very rich, especially in the Transvaal, where there is also mercury.
4. Copper is worked mainly in the Cape, Darfur, and the Atlas Region. It is also found in the Transvaal.
5. The diamonds are largely confined to the Kimberley district of the Cape, and the salt 'shots' are most productive in the Western Sahara.

## North Africa.

1. THE Barbary States may be divided into two parts—a mountainous western part and a low eastern part.

1. The height and the nearness to the Atlantic give the western part a much better rainfall than the eastern, but in both parts the Mediterranean slope has much more rain than the Sahara slope. In Marocco the Great Atlas is a real mountain range, with a lower parallel chain in the Anti-Atlas; but in Algeria and Tunis the formation is really a broad plateau with buttress ranges.
2. The plateau is covered with salt-swamps, or 'shotts', the seaward buttress contains a number of fertile valleys, known collectively as the Tell.

2 The products of the region correspond to its physical features.

1. The fertile valleys and coastlands suffer sometimes from drought, and are greatly in need of navigable rivers, but they are usually exceedingly productive, and the dry air is very favourable to special products, *e.g.* flowers (cf the great export of honey and wax) and fruit (cf the great export of wine).

The special products of Marocco, which suffers less from drought than any of the other States, are beans and cattle; the Algerian 'Tell' produces excellent early vegetables (for France), mainly potatoes,—grain, mainly wheat and barley,—fibres, especially tobacco and flax,—fruit, mainly grapes and olives (also oranges and lemons); and the Tunisian 'Tell' produces barley, grapes, and supremely good olives.

*N.B.*—Both the wheat and the olives are in great demand at Marseilles, the hard wheat (very rich in gluten) for alimentary pastes, and the olives (and linseed) for the various 'oil' industries.

2. The droughty interior produces specially esparto (and salt), but there are large areas which support millions of sheep and goats; and the intermediate 'mountain' slopes are covered with forests, which supply tanning materials and immense quantities of cork.

- 3 The shallow shore-waters, which make the area so deficient in good harbours, are exceedingly favourable to the growth of sponges, especially in the Sidra-Gabes Gulf, and to various fishing industries, *e.g.* for sardines

*NB*—All the States have a transit 'Sahara-Sudan' trade in ivory, gold, dates, and the best ostrich-feathers in the world

3. The French Protectorate of Morocco is removing the old evils due to misgovernment at home and international jealousies amongst the Great Powers, but the land suffers from drought and locusts

1. The commercial centres are generally ports, *e.g.* Tangier, Dar el Beida, Mazagan, and Mogador, or towns commanding inland communication, *e.g.* Fez and Mequinez in the upper basin of the Sebu, or agricultural wealth, *e.g.* Morocco on the fertile plain of the Tensift—famous for its barley
2. The sheep and goats of the Great Atlas support the characteristic leather and rug industries, especially at Fez; and the *carmine* colour of the 'Fez caps' is due to the presence on the Atlas slopes of the species of oak which supports the *kermes*.

4. The Algerian towns are all in the narrow coast-plain; but most of the people are scattered over the fertile Tell in agricultural villages.

1. Oran and Mostaganem are commercial centres in the west, exporting esparto, barley, and tanning barks, as Bona and Philippeville are in the east, exporting specially wool, cork, fish, fruit, and olive oil; and, owing to the nearness of the outer terrace to the sea, the railway system connecting them with Algiers runs entirely inland parallel to the terraces, *e.g.* along the valley of the Shelif

*NB*—The railways from Biskra and Moghar carry great quantities of dates to Bona and Oran

2. Nearly all the towns have flour and oil mills, and manufacture macaroni and other alimentary pastes; the eastern ports tin sardines, forest centres like Batna and Mascara have cork-cutting industries, and wine is made widely. A number of towns, *e.g.* Constantine, have soap works in connection with olive 'waste'; 'morocco' is the special product of the steppe-pastures, *e.g.* round Busada, and the rich deposits of ore between Tlemcen and Benisaf support local iron industries.

3. 'Algiers, or 'The Islands,' divides the distance between Port Said and London better than either Malta or Gibraltar; it has a safer anchorage than Gibraltar, and gives greater facilities to shipping, its large area makes it very useful as a fishing-port and a refuge, and it has the advantage of two docks for repairs, abundance of fresh fruit and other provisions, and ample room for such bulky items as timber, coal, and wine casks, the export of wine being very large.
5. Tunisia produces the best olive-oil and dates in the world, as well as wine and grain, cork and esparto.
  1. Bizerta and Goletta are commercial centres on the north coast, as Susa and Sfax are on the east coast, exporting mainly sponges and fish, cork and esparto. Susa commands the route inland to the alfa region west of Kairwan, and Sfax the railway to the great Algerian deposits of phosphates round Gafsa.
  2. Tunis owes its importance, not to the wretched harbour of Goletta, but to its position in the most central and narrowest part of the Mediterranean, with easy communication inland up the Mejerda valley; it has also now a ship-canal to the sea, and monopolises the famous carpet-weaving industry of the country.
6. Tripolitana owes its importance to the number of caravan routes which converge on it, and is beginning to flourish under its new Italian rulers.
  - 1 The reason for this is that, owing to the deep indentation of the Sidra-Gabes Gulf, the starting points of the caravans—Tripoli, Khoms, and Benghazi—are 250 miles nearer to the Sudan than the Algerian and Tunisian ports; and even the railways from Oran to Ain-Sefra and from Philippeville to Biskra can not compete with the Tripolitan caravan routes
  2. Ghadames and Murzuk are the most important inland centres with a great transit trade in feathers, ivory, and skins, mainly from Kano *via* Agades and Ghat. These products are prepared for foreign markets in such towns as Zavia, Misrata, and Gharian, as well as at Tripoli, but the latter monopolises the export (also of barley, sponges, and esparto).

### The Nile Region.

1. THE Nile valley may be divided into five natural zones—of delta, desert, steppe, savanna, and lake.

1. The Lake zone (cf. the great Eastern Plateau) contains the reservoirs to which the Nile owes the constant and reliable part of its volume, and the White, or 'Clear,' Nile owes its clearness to the filtering of its mud in the lakes
2. The Savanna zone (between Lado and Fashoda) is so level that the current becomes very slow, the river is choked with floating vegetation, and the land is easily flooded in the two long and rainy seasons (with short dry season between them) into which the year is divided. The river-side pastures are so rich that even the Denka negroes have forsaken agriculture for cattle-rearing, and the Nile-Congo water-parting is so rich in iron ore that the Bongo negroes have also exchanged their ordinary occupation of tillage for that of skilled mechanics.

*N B*.—The cattle and iron, like the rubber, gums, cotton, and ivory of the surrounding forest, are exported *via* Fashoda

3. The Steppes (between Fashoda and Berber) show a gradual transition from a fertile rainy district to a barren dry one. They are very important, however, because it is to the torrential rain round the sources of the Blue, or 'Muddy,' Nile that Egypt owes its fertilising floods, and because they command such valuable trade-routes—*e.g.* *via* Berber or Kassala to Port Sudan (and Sawákin) and Massowa, or *via* El-Obeid to the wheat and tobacco lands of Darfur, the Hofrat copper, and the Eastern Sudan generally.

*N B*.—The great rail and river junction of Khartum commands three great waterways—N, S, S.E.—and controls the whole supply of water and mud which alone makes agriculture in Egypt possible

4. The importance of the desert is due partly to the fact that the long narrow river-valley has been the one highway of commerce through a land naturally isolated by barriers of desert; and partly to the fact that the new dam at Assuan stores the surplus flood which formerly ran waste, and lets it out in winter—'low Nile'—so that agriculture is possible the whole year round. The important centres are either where there are special facilities for irrigation, *e.g.* Siut, or where cataracts break regular navigation, *e.g.* Assuan and the great railway junction of Wady Halfa, or where a sudden bend in the course of the river offers a 'short cut' by rail or caravan, *e.g.* Keneh, Korosko, and Abu Hammad.

*N B*.—Wheat, pulse, and sugar-cane are grown along the river.

Important commercial routes follow the lines of the various oases which lie between Assuan and the Tripoli frontier, *e.g.* great commercial routes from Siut and the Farafrah oasis converge on the Dakhel and Kargheh oases for Darfur.



On the Red Sea Littoral, Port Sudan, the terminus of the line to Berber (for Khartum), has outstripped Sawákin, though the latter is the best natural harbour on the Red Sea.

The 100 miles of the Canal save 3000 miles on the Cape route from Liverpool to Bombay, and three-quarters of the steamer tonnage using it is British, but, as the 'canal' type of steamer is by no means suited to the stormy Cape route, any block in the canal would completely disorganise our Eastern traffic except *via* Canada.

*N B*—Port Said and Ismailia, of course, owe their very existence to the canal, but Suez has not benefited much by it. The canal now admits vessels drawing 30 feet, *i.e.* more than the maximum (29 feet) at Calcutta.

2. The Delta consists of the refuse of the Abyssinian Mountains, and the whole of it is irrigated by artificial canals or by back-waters of the Nile.

1. It is, therefore, by far the most fertile and most important part of Egypt, and contains more than half the total population—mainly employed in raising (long-staple) cotton, maize, and rice; and, as the climate is sufficiently continental to grow also onions, wheat, and beans, it is quite healthy except during the subsidence of the floods.

*N B*—The Delta area includes the old lake-bed of the Fayum.

2. The only branches of the Nile that still reach the sea are those from which the little towns of Rosetta and Damietta take their names, and most traffic goes westward; but Rosetta is overwhelmed by its nearness to Alexandria, which, with its fine artificial harbour, is the chief port of Egypt, and commands all traffic from or to the west. It is joined by a ship-canal to the Rosetta mouth of the Nile, and by rail to every important town in Egypt.
3. Cairo, however, is the most important city in the country. It stands above the river on the most northerly spur of the eastern plateau, where all traffic must converge to enter or leave the Nile Valley; and it commands the whole rail, river, and canal system, including the Fresh-Water Canal to Ismailia.

### The Calms of Cancer.

1. THE Sahara forms the western terminus of the great belt of deserts which stretches across the Old World from Mongolia to the Atlantic, and which is due simply to the absence or the deficiency of rain.

1. The North Tropic is the centre of a belt of 'high pressure' calms in January, as the South Tropic is in July, and, though in summer the intense heat over the sandy Sahara draws winds inland, the heat itself tends to evaporate rather than to precipitate moisture.

*N.B.*—On the seaward edge of the desert, where the winds are naturally wettest, there is either no condensing medium, *e.g.* in the Libyan and Gidi Deserts, or the medium is an absolute barrier to the passage of the winds inland, *e.g.* the Atlas

2. The enormous variation in temperature between day and night splits up the solid rock in all directions—to be distributed by winds; and, as there is no vegetation to bind together the surface, the torrents, caused by thunder-storms, carry down immense quantities of loose soil
3. The porous nature of these shifting sands, especially in the Hammada, enables any rain to sink into the ground before it can be evaporated, and this encourages the boring of Artesian wells; while the impervious nature of the 'Shott' beds allows any surface water to be evaporated before it can sink, thus covering the ground for miles with a crust of salt, especially in the Western Sahara.

2. The soil, as in nearly all rainless areas, is very fertile; and the vegetation is of two kinds—a real desert kind and an oasis kind.

1. The oases supply the date-palm, the most important product of the Sahara, and cereals and fibres (cotton and tobacco)
2. The true desert vegetation consists of plants which, by lengthening their roots or shortening their height or thickening their bark or limiting the size of their leaves, have adapted themselves to draw water from great depths or to resist the evaporating power of the intensely dry air Cf p 231.
3. The centres of population are naturally where the water supply is most permanent, *i.e.* in the oases, *e.g.* Bilma, Kavar, and Adrar, and on the mountain-slopes, *e.g.* Tibesti, Borku, and Air (=Asben) And, as the spring-water of the oases is much more reliable than the summer rains on the mountains, agriculture is practically confined to the oases, and, therefore, they have a fixed Negro population, with important cotton and leather industries

*N.B.*—The typical desert people are not fixed and agricultural, but nomad and pastoral, and, therefore, the population of the Sahara generally is a wandering Hamitic one, and the dry air of the desert makes the Hamitic nomads much healthier and hardier than the fixed Negro population of the moist oases

3. The trade of the Sahara is partly a transit trade and purely local, and it is still largely done by camel, though the development of railways in the Nile and Niger basins is having a very marked effect.

1. There is a natural exchange of products between the temperate, coastal Barbary States, and the tropical, continental Sudan. From the north come the grain, cheese, and wool of Algeria and Marocco, and various European goods, *e.g.* cottons, tea, sugar. From the south come gold, slaves, ostrich feathers, ivory, gum, and wax.
2. The local trade is in the two desert staples, dates and salt. The dates come mainly from the northern oases, *e.g.* Tafilet and Murzuk, and are exported northwards, the salt comes mainly from the really 'desert' parts of the south-west, and is naturally exported southwards, especially from Tanderi to Timbuktu, so that it has suffered most from the competition of the 'Niger' railways. Tafilet is also famous for its leather and fine woollen 'haiks'.
3. There are five great trade-routes. The most important and the most central is from Tripoli, *via* Ghat and Air, to Kano. The others are from Mogado, *via* Tenduf, to Timbuktu; from the Atlas region, *via* Tuat, to Timbuktu, from the Fezzan, *via* Kavar and Bilma, to Kuka and Lake Chad; and from Benghazi, *via* Aujila and Kufra, to Wadai.

*NB*—The Sahara is one of the greatest barriers in the world to the movement of men and animals, of the want of roads and of harbours in West Africa, but it is being penetrated by the French from north, west, and south by railways, and the use of 'sun-power' is going to solve many of the problems, *e.g.* the raising of water from beneath the great sand-dunes.

### Central Africa.

1. CENTRAL AFRICA is mainly an enormous producer of vegetable 'raw materials,' and has five natural product areas

1. The oil-palm, banana, and coconut are typical of a very large area in the west along the equator (mainly northward), and a smaller area in the east along the equator (mainly southward) Cf the copal, kola, and vegetable butter.
2. Coffee, bananas, tropical cereals, and cattle-pasture are typical of a broad strip from the north of Abyssinia to the Tropic of Capricorn
3. Cotton, maize, millet, and cattle-pasture are typical of the continental Sudan, or 'Land of the Blacks'
4. The eastern, *i.e.* damper, edge of the Great Plateau from the equator to the north of Abyssinia, is an area of tropical 'Highland' culture, including wheat and barley

2. The Sudan may be roughly divided into a continental plateau and a coastal plain.

1. The north border of the plateau is a series of sand-dunes; the south is a strip of forest, and between the two, durra (millet), cotton, beans, rice, and indigo are widely cultivated—the product varying with the rainfall. There are splendid cattle-pastures along the Niger, and good horse-pasture in Bornu Guinea corn (a millet) is important in Hausaland.

*N.B.*—Ostrich-feathers and goat-skins are products of the sandy north, as ivory is of the forested south.

2. The Trade routes in the Sudan, unlike those in the Sahara, run east and west, because commerce was impeded by the sand-dunes along the north and by the dense forest along the south, but was encouraged by the savanna plateau in the centre and by the general east-and-west direction of the rivers. Consequently, nearly all the old commercial centres lie along the Sahara border, *e.g.* Kuka, Kano, and Sokoto, or along the southern forest-belt, *e.g.* Kong, Sulaga, and Ilorin. Cf p 187, § 5 (3)

- 3.<sup>r</sup> The Atlantic tides have so completely checked the course of coastal rivers seaward, that a false shore has been built up, backed by lagoons. Between these lagoons and the old shore there is a belt of dismal swamp, to which the Ivory and the Slave Coasts mainly owed the particular products that gave them their names; but the wealth of the country now lies in the oil-palms, rubber-creepers, and ebony which grow to perfection in the deadly moist, hot, even climate

*N.B.*—Kola, gum-copal, ground-nuts, and pepper are also important.

- 4 The most important centres in the British domains are—Freetown, the best harbour along the whole coast, half-way between England and the Cape,—Lagos, the most important town on the Gulf of Guinea, because a safe port with easy communication inland,—Cape Coast Castle, which commands the only good route to Kumasi and Bontuku,—the river port of Rabba, the leather and indigo market of Bida, —and the old caravan termini of Kano and Katsena. The newly discovered Port Harcourt is a very fine harbour

*N.B.*—The colony of Lagos, like the 'Mandate' area of Togoland, specialises in palm-oil

- 5 The most important centres in the French domains are—Dakar, the fine harbour of St Louis,—Bamako, the head of navigation on the Niger,—and the great salt market (Tandeni salt) of Timbuktu, which owes its importance to its site on the edge of the plateau above the Niger swamps, where it is the natural focus for caravans from the Barbary States, *via* Tuat. Kayes, the head of navigation, commands the Senegal route to Bamako and Koulikoro

### 3. The Congo region contains the largest and much the most important area of low land in Africa.

1. The lowest part of this area lies between 5° S. and 5° N., where the low elevation, the equatorial heat, and the abundance of water, produce dense tropical vegetation and an almost impossible climate. The vile climate, the labyrinth of waterways, and the dense forests, make the area extremely difficult to govern; and the difficulty is increased by the absence of a common native language. The unfavourable conditions of forest life have also produced a most degraded type of people.

*N.B.*—Out of every *ten* European officials in the Belgian Congo, *nine* die or are invalided home within three years, though there is abundance of pure water

2. On either side of this area of equatorial rainfall and unvarying temperature, the elevation rises, and the rainfall decreases; and, as the forest consequently becomes much thinner, the climates improves both for man and beast.

3. The Belgian Congo has enormous natural supplies of vegetable wealth, at present consisting mainly in oil-palms, rubber-creepers, and orchilla, and, outside the forest area, its climate and soil offer every inducement to cultivation. Coffee cultivation has already proved successful, and the Bantu inhabitants are naturally tillers of the soil, and cultivate the natural products of the area—bananas, manioc, and cereals. Moreover, the forest area has been so recently opened up that it still produces abundance of ivory.

The development of the country depends almost entirely on the waterways; and, therefore, all the important centres are on the great arteries. The most important is the harbour of Leopoldville on Stanley Pool, where all these arteries meet; and the next in importance are New Antwerp or Bangala (=Liboko), on the great north-west bend of the main stream, and Kibonge, Nyangwe, and Kasongo, on the Upper Congo.

The development of the waterways depends in turn on access from the sea. The Congo is navigable for the largest merchant vessels from the out-port of Banana up to the in-port (and capital) of Boma, and large vessels can reach Vivi; but between Vivi and Stanley Pool navigation is absolutely impossible, and the railway 'round' the rapids from Matadi to Dolo now forms part of a complete trans-continental rail and water route, *viz* Kabola, from Banana to Dar-es-Salaam. Cf. p. 228.

4. There are five chief outlets for the produce of Angola—the Congo, Ambriz, Loanda, Benguela, and Mossamedes.

Mossamedes exports the cattle and other wealth of the European settlers in the Kunene basin—guano and nitrate of soda from the semi-desert strip immediately behind the town—and fish, which are brought to the excellent harbour of Little Fish Bay by the cold Benguela Current.

The roadstead of Benguela is now superseded by the fine harbour of Lobito Bay, the terminus of the nearly complete Katanga 'copper' railway.

Ambriz, like Benguela, is an open roadstead which would be useless except for the fact that tempests are very rare. It owes its importance entirely to its good route up the Loge Valley to the coffee plantations of Encoje.

The 'Congo' ports naturally export palm-oil, rubber, and ivory from the lowlands of San Salvador, Cazengo, and Cabinda, mainly from the ports of Landana, Cabinda, and Ambrizette.

Loanda is much the best harbour on the whole coast, being protected from the ocean swell and the dangerous

winds (S W) by a small island; it commands both the railway route to Malanje, *via* Ambaca, and the river route, *via* Dondo

5. The Adamawa district of the Kamerun is famous for ivory, its forest-grown tusks being much more perfect and much less brittle than those grown in open country, but the product is exported mainly *via* the Benué or the Saharan caravans, not *via* the good harbour of Victoria

*N.B.*—In the French territory similar causes make Loangó more important—though a worse harbour—than Libreville.

4. East Africa consists mainly of a broad high plateau buttressed by very steep escarpments.

1. Abyssinia may be divided into three climatic zones, with corresponding zones of vegetation. The purely 'tropical' zone is all the land below 5000 feet, *i.e.* the outer slopes of the plateau and the river valleys. They are largely covered with dense elephant-haunted forests, but, in the more open parts, coffee, cotton, sugar, bananas, and indigo are cultivated. The 'warm temperate' zone includes the ordinary plateau lands, and produces all the cereals and fruits of South Europe as well as excellent cattle pasture. The 'cool temperate' zone includes all the land above 8000 feet; and its most valuable product is the musk deer.

*N.B.*—Coffee is indigenous, and possibly takes its name from *Kaffa*

Almost all the chief towns lie in the middle of agricultural areas, *e.g.* Gondar and Korata, or on trade-routes, *e.g.* Ankobar, Addis Abeba, and Adua. Adua and Ankobar command the foreign trade *via* the Red Sea and the Gulf of Aden, the most important exports being coffee, gold, ivory, civet, and wax—most of them Imperial monopolies.

*N.B.*—Italian influence is focused in Eritrea, where the island harbour of Massowa is the natural outlet for Abyssinia, and commands in Kassala a convenient outpost for tapping the Sudan

2. The only place of real importance in the Somali peninsula is Harar, which commands the best route between the Galla countries and Zeila or Jibuti, and the trade of which will be greatly improved by the new French railway from Jibuti. The characteristic products of the country are very excellent coffee, myrrh, and frankincense. The two latter are largely collected at the important caravan junction of Jerlogubi, and exported *via* the port of Berbera or *via* one of the El Benadar roadsteads (Magadoxa, Marka, Barava)

*N.B.*—The British and French 'coasts' have little commercial importance; but Sokotra exports cattle and aloes—from Tamarida.

3. The coast-lands of British and 'Mandate' East Africa have great heat and heavy rain, except towards the Somali desert, and they are therefore covered with rank tropical vegetation, including bananas, gum-copal, and rubber-creepers. Those parts of the plateau scarp which are exposed to regular sea-winds, are covered with a belt of forest below a belt of bamboos, and there is still a large export of ivory from the Uganda forests (also famous for coffee). On the plateau generally millet and cassava are the most important cultivated plants, and there are magnificent cattle pastures, but in the western trough, where the heat is very great owing to the low elevation, the rainfall heavy, and the soil very fertile, whole districts are covered with groves of bananas.

*N B*—Ivory, rubber, and cattle are the most valuable exports.

Rubber is exported *via* Wanga, Malindi, and Lamu; but most of the trade of the country goes through Kismayu northward or Mombasa southward. Mombasa, on a coral island joined to the mainland by a railway bridge, is the best natural harbour on the East African coast, and will be further benefited by the Uganda railway. As the bulk of trade still gravitates instinctively to Zanzibar, the old centre, Mombasa is, in the meantime, much more important than Kismayu; but the Juba Valley is a natural 'Line of Least Resistance.' Cf the position of Tanga as a terminus.

The importance of Zanzibar is largely due to its long monopoly of the East African slave-trade, but it has a splendid central position opposite some of the best natural routes inland, and is extremely fertile. The city of Zanzibar stands on the west side facing the mainland, where its shallow roadstead is sufficiently sheltered by the island itself to make a fairly good harbour.

*N B*—The revenue of Zanzibar—as of its neighbour and dependency, Pemba—is mainly derived at present from a single crop, cloves, which are unusually risky to cultivate, but copra and chillies are becoming important.

Bagamoyo owes its importance only to its position between Zanzibar and the end of the old slave-route to Lake Tanganyika (Ujiji) *via* Mpwapwa and Tabora; its rival, Dar-es-Salaam, has a better harbour, and will probably become the more important railway terminus.

*N B*—The slave-trade was intimately bound up with the ivory-trade, and is dying a natural death with the extermination of the elephants.

5. The Zambesi region is simply a continuation of the Great Eastern Plateau—on a smaller scale.



1. Above the Victoria Falls the river is a magnificent waterway, especially after the confluence of the Kwando, but navigation is completely stopped by the Gonyé Falls. Between the Victoria Falls and the Kebra-Basa Rapids the river is less useful, mainly owing to the pace of the tributaries from the high escarpment on each side, and to the number of rapids which become unnavigable at low water, this is also the area most infested with the dreaded tsetse fly

*N.B.*—This pest is harmless to men, but fatal to horses and cattle, and has therefore encouraged the slave-trade, but it has disappeared elsewhere in Africa with the disappearance of big game, and may do so here.

The lower reach of the river from the Kebra-Basa Rapids to the sea is a fairly good waterway, but the low level and the abundance of alluvium cause it to be obstructed by shifting sand-banks—the residue going to make the deadly delta. This section is, however, the most important because it receives the Shiré tributary, which is more or less navigable up to Lake Nyasa except for one series of rapids, and because there is coal near Kebra-Basa. Navigation on the Shiré is so bad, however, below Port Herald that the railway has been extended to the Zambesi.

*N.B.*—Chindé commands the only really useful passage through the delta, but it is very unhealthy and simply alive with mosquitoes. It is a 'Free Port'

2. All the old centres of the Portuguese territory are being replaced by new ones that are being developed by the transit trade to British Central Africa. Thus, Quilimane is being replaced by Chindé, Sofala by Beira, and Inhambane—except for rubber—by Lourenço Marques.

Mozambique, the most important town in the north, like so many African ports, is on an island; and the island shelters the harbour of Mosuril Bay (cf. Mombasa). Besides its through trade to British Central Africa, it collects local supplies of oil, rubber, copra, wax, etc. Lourenço Marques has a magnificent harbour on Delagoa Bay, sheltered by a tongue of land from the S.E. gales, and with easy access to the Transvaal; and it is the terminus of the most important railway in East Africa. Beira also owes its importance to its easy access inland by rail—up the Pungwe valley to the Mashona gold-fields, *via* Umtali

*N.B.*—Lourenço Marques, in the middle of a swamp, is extremely unhealthy

- 3 British Central Africa has been developed from the natural sanatorium of the Nyasa highlands, the capital having been changed from Blantyre to Zomba. The native trade in spontaneous products, especially the ivory of Kambombo and Senga and the rubber of Bandawe, has been developed,

and various tropical and semi-tropical plants have been cultivated, *e.g.* coffee and cotton, and the latter is now the staple product. Nyasaland produces some of the best coffee in the market, though the area for it is limited, and the castor-oil plant grows wild so luxuriantly that it is becoming a pest.

*N B*—There is also a first-rate harbour close at hand, for the Bandawe district, in Nkata Bay, but there is great need of a railway to get the products out of the country before the rains, which have spoilt many a fine crop.

4. The importance of Rhodesia is due mainly to the fact that its height and its latitude make it more suitable for Europeans than any other equal area of tropical Africa. The natural slope makes the plateau fall much more steeply towards the sea than inland, and, as the seaward face, of course, also gets the heaviest rains, the deep eastern valleys, *e.g.* those of the Mazoe and the Sabi, are covered with very fertile alluvium. The gentle westward slope ends towards both the Zambesi and the Limpopo in low veld, which is magnificent natural pasture, though the presence of the tsetse-fly makes the Zambesi veld useless in the meantime.

The rich alluvial valleys along the eastern escarpment produce wonderful crops of all kinds of tropical plants, especially rice, sugar, and cotton, but the staple products of the country are maize and Kaffir corn. The presence of hemp and tobacco, as well as cotton, growing wild, *e.g.* in the Hanyani, Umquadzi, and Mazoe valleys, proves that both soil and climate must be admirably adapted to fibres; and, as the country is being developed mainly by a mining population, the tobacco will become extremely important.

*N B*—The natives smoke the hemp as well as the tobacco, but hemp-smoking causes certain death within quite a few years.

The watershed is mainly granite, but is intersected by areas of the best possible formation for gold, *i.e.* quartz and blue slate, the chief rivers have abundance of water, and the 'mopani' bush provides sufficient timber for successful mining; and there is good transport by rail *via* Bulawayo and the Cape, and *via* Umtali and Beira. Except the two great commercial centres of Bulawayo and Salisbury, the towns are almost entirely centres of mineral wealth along the railway or the great road from Bechuanaland to Salisbury, *e.g.* Macloutsie, Tuli, Victoria, Umtali, Gwelo, Selukwe, Gwanda, and Hartley, and towns are springing up along the 'Cape to Cairo' railway from Bulawayo, *via* the important Wankie coalfields, to Livingstone and Broken Hill.

*N B*—Rinderpest and locusts cause terrible losses to 'farmers' in this area.

## South Africa.

1. THE Calms of Capricorn, like those of Cancer and for the same reasons, are marked by desert.

1. The Kalahari Desert, like the Sahara, merges towards the Equator in an area of inland drainage, the basin of Lake Ngami, which is connected with a series of salt-pans ; but—owing to the narrowness of the continent—it is much smaller and less arid than the Sahara, and so has larger supplies of subterranean water and a considerable covering of coarse grass.

2. The rainfall in 'Mandate' S W Africa is generally too small everywhere for agriculture, though the Damara highlands encroach on the moister regions of constant equatorial rainfall, and, therefore, cattle-rearing is the only hopeful industry except the copper-mining in Great Namaqualand. Thanks to its central position, the fairly permanent volume of the Swakop River, and the command of the trade-routes converging on Walvisch Bay, Windhoek was made the chief centre, and an attempt has been made to develop the harbours of Swakopmund and Angra Pequena (= Luderitz).

The British possession of Walvisch Bay is, however, the only good harbour, and commands all the best routes into the interior—up the watercourses of the Swakop and the Kuisip. Moreover, as the distance from the Bay to Vryburg is less than 800 miles, a railway between the two places *via* Sandfontein would save two days' journey by sea and one day's journey by rail over the present Cape route to the Witwatersrand.

3. The importance of Bechuanaland is due mainly to the fact that it contains part of the great 'Cape to Cairo' route along the Eastern Plateau, the communication being made exceptionally easy by the level surface and by the artificial character of the boundaries. But the height and the dry air also make it very healthy ; and, as there is also excellent pasture, the plateau forms an important basis for the British position northwards to the Zambesi. West of the hills which run due north from Kheis to the Molopo, the land is a waste, forming part of the Kalahari desert,

and the eastern part is also very dry ; but the soil is naturally fertile, the summer rains (25 inches) might be stored, and irrigation produces very large crops of maize and millet, especially in the Hart basin

The political capital is Vryburg ; but both Taungs and Mafeking are more important, as they have the advantage of rivers—the Hart and the Molopo—as well as the railway. Taungs trades (in maize, wool, hides, cattle, etc.) with Kimberley, and Mafeking, which is the largest town, controls the trade with the Protectorate and the Transvaal.

*N.B.*—The only town of any size away from this eastern border is Kuruman, which collects salt from the desert Cf Tadmek in the Sahara.

2. The Transvaal and Orange Free State consist of a broad high Plateau, with an undulating surface, entirely cut off from the sea by the Draken-Berge.

- 1 The plateau, known as the Veld, is generally sandy, the surface is grassy, and the climate is extremely healthy, and, though most of the area falls within the belt of the Capricorn Calms, its nearness to the ocean and the height of the Draken-Berge give it a far better water supply than Bechuanaland
2. The High Veld of the Transvaal—an area, about the size of Ireland, between the Vaal River and the Magalies Mountains—is destitute of trees, and very dry during the winter months ; but it is wonderfully bracing and healthy, and has splendid sheep pasture, especially round Pretoria, it is also extremely rich in gold, producing  $\frac{1}{3}$  of the whole world's output.
- 3 The richest gold-fields lie along the Witwatersrand, i.e. the hilly ridge which divides the Orange basin from that of the Limpopo, and the great centre is Johannesburg, which since 1885 has sprung up into a city of 240,000 inhabitants. There are also rich fields amongst the Draken-Berge valleys, e.g. the De Kaap, on which the towns of Barberton and Lydenburg have sprung up. Coal also exists in large quantities, e.g. round Middelburg, Belfast, and Boksburg, and is very useful in the almost complete absence of timber ; but gold is the great staple.

*N.B.*—The Dutch are almost entirely occupied with sheep and horse-farming, on the Middle Veld they raise also cattle and grain, especially maize (mealies) ; and in the tropical Bush Veld they are mainly engaged in planting coffee and sugar-cane

- 4 The mining and railway centres are already big cities or rapidly becoming so, e.g. Heidelberg and Middelburg,

- the gold centres of Ermelo and Klerksdorp, the coal centres of Boksburg and Springs, the great junctions of Pretoria and Germiston (formerly Elandsfontein), but have all been outpaced by the commercial capital of Johannesburg, which has direct connection by rail with five different railway termini round the South African coast—Cape Town (about 1000 miles), Port Elizabeth (about 700), East London (665), Durban (483), and Lourenço Marques (about 400)
5. There is also considerable mineral wealth in the Orange Free State, including diamonds at Koffyfontein and Jagersfontein, and coal near Kroonstadt and Heilbron, but the special products are magnificent wool and ostrich feathers, *e.g.* round Bloemfontein and Winburg, and cattle from the Caledon valley, *e.g.* Ladybrand and Smithfield, and along the railway from Harrismith to Bethlehem. The dry air and want of water practically prohibit agriculture without irrigation; but splendid fruit is produced on irrigated orchards, *e.g.* at Parys, and along the Caledon—especially in Basutoland—very fine wheat is grown

### The Cape of Good Hope.

1. THE Cape is of immense value to the British Empire, because it commands the most important trade-route in the 'water,' *i.e.* the southern, hemisphere.
  1. Table Bay is exposed towards the north-west, and is, therefore, not quite safe during 'Anti-Trade' gales, but Cape Town is the only harbour of real importance between St. Helena and Mauritius for India-bound vessels, and between St. Helena and Albany for vessels in the Australian trade. It is also the only convenient coaling-station for vessels before they enter the latitude of 'The Roaring Forties'
  2. The best harbour on the rest of the Cape coast is Algoa Bay; but even that is exposed toward the south-east, the stormy quarter, and does not admit the largest vessels even to the great mercantile centre of Port Elizabeth. East London is a much better harbour than Port Alfred or Mossel Bay.
  3. The best natural harbour is Saldanha Bay, about 60 miles north of Cape Town; but, as it has neither supplies of fresh water nor communication inland, it has no value except as a refuge. Simon's Bay is large and sheltered; but the

entrance is dangerous, because Cape Agulhas extends a long way seaward beneath the surface of the water, strong currents sweep round the Cape, and the meeting of the cold Benguela current with the warm Mozambique current causes dense fogs.

2. The Province is of typical African formation—a large plateau rising abruptly in parallel terraces from a moist coast-strip to dry flat-topped ‘mountains’—really the steep escarpment.

1. The third terrace leads to a plateau nearly half the size of England, called the Great Karroo—from the Hottentot name for a shrub that grows on it; and, as the average elevation of it is 3000 feet, the rainfall is too slight for anything except sheep pasture
2. The rivers that flow northward from the water-parting of the Nieuwveld Mountains are fed mainly by thunder-rain; and they are, therefore, very variable in volume (cf the Orange). The southward rivers *eg* the Gauritz, Gamtoos, and Sunday, vary much less, and might be very useful for irrigation; but the sudden and violent floods to which they are subject, cause them to plough such deep channels that irrigation by gravitation—the only cheap method—is practically impossible

3. With such a scanty rainfall, it is obvious that agriculture must be extremely limited.

1. Wheat and maize are the chief grain-crops, the wheat being naturally grown in the drier and cooler south-west, while the maize is grown in the damper and hotter south-east. The best wheat comes from the Malmesbury plain; most of the maize, or ‘mealies,’ come from the district between Uitenhage and King William’s Town.

*NB*—On a plateau in such a latitude both filtration and evaporation are very rapid, and so, even in the districts which have the heaviest rainfall, irrigation is a necessity.

2. The vine is, however, eminently adapted to such a dry climate, and is said to grow more luxuriantly in the south-west than in any other part of the world. The most productive vineyards are on the warm, dry slopes of the lowest terrace, *eg* at Paarl, Stellenbosch, Constantia, and Wynberg (‘wineburgh’), and the proximity of these places to Cape Town, the ease with which cork-dust can be imported from Lisbon, and the nearness of Cape Town itself to London, have caused also a large export of grapes. Cf p. 257, § 3 (2).

3. Tobacco also grows well in the south, especially in the rich limestone valley of Oudtshoorn, where the shelter of the Zwarte-Berge and the Lange-Berge to N and S, the number of streams, the proximity to the sea, and the presence of extensive forests between the Lange-Berge and the sea, seem to guarantee permanent success to the planters

*NB*—In such a treeless country these forests are specially valuable, and supply wood for wagon-building.

4. The pastoral wealth is much greater, therefore, than the agricultural, and is mainly in sheep and goats.

1. The coast-lands, however, are suitable for cattle, especially in Transkei and Pondoland, and there is a large demand for transport oxen for the wagon-traffic over the roadless plains of the interior.
2. The goats are much more numerous than the cattle, and are of two kinds—native and Angora. The former are very hardy, but the latter are much the more valuable. Most of them are kept on the Upper Karroo and the eastern half of the Great Karroo, especially round Richmond and Graaf-Reinet, and the mohair is exported *via* Port Elizabeth.
3. The sheep, like the goats, are of two kinds—native and Merino; and in the very dry north-west the native is even preferred. Elsewhere the Merino is the most valuable animal in the country. The most important sheep farms are also on the Great Karroo, and there is great mortality amongst the sheep in a dry season, but this is mainly due to bad farming—*e.g.* overstocking the land, keeping the kraals dirty, or wearing out large areas of good pasture by always bringing the sheep to the same kraal by exactly the same route.
4. Ostrich-farming requires special knowledge and experience; and, as profits are peculiarly dependent on the caprices of fashion, only wealthy capitalists can risk the possible heavy losses or the long waiting for gains. The centres of the industry are Uitenhage and Grahamstown.
5. The scarcity of fuel, which will probably prohibit any important manufacturing industries except tanning, has also hindered the development of the minerals.
  1. Coal does exist in considerable quantities in the Storm-Berge, *e.g.* at Indwe, Molteno, and Cyphergat, and can be quarried out of the hillsides; but it is of very poor quality.

2. Copper is also found in various parts, and exists in valuable quantities in the old rock of Namaqualand. The richest deposits are at Ookiep, which is connected by a tramway with the roadstead of Nolloth.
3. Diamonds are, however, the great mineral product, and usually realize more than £5,000,000 a year. The chief mines are in the blue clay of Griqualand West, where archaic and mesozoic formations meet in the valley of the Vaal. Kimberley is the centre, and lies in the natural Line of Least Resistance for the transcontinental railway.

### Natal.

1. THE surface, like that of The Cape, rises in steep terraces, and Port Natal is the only good harbour.

1. This bay, however, is by no means an ideal harbour, as it has a shifting bar and is quite shallow, but, as it is the best harbour on the coast, it monopolises the trade of Natal, and does a large share of the Orange Free State and Transvaal trade. Durban itself is well sheltered by a spur of land that juts out south-eastward into the bay.
2. The western boundary is the natural obstacle of the Draken-Berge, and the passes across the range, though few and steep, have become very important. The Van Reenens Pass gives railway access to the Orange Free State, and the pass below Majuba Hill gives railway access to the Transvaal; and there is, fortunately, a valuable coalfield between the two along the slope of the Draken-Berge.
3. The height of the innermost terrace, which is practically the Draken-Berge, and its nearness to the warm Mozambique current, guarantee much more rain than in The Cape, and the steepness and frequency of the terraces, though they make continuous navigation impossible even on the Tugela, offer special facilities for motive power and irrigation.

*N B* —The torrential character of the rains, however, has cut up the surface, as in The Cape, with deep 'kloofs' which impedes irrigation.

4. The climate is not nearly so healthy as in The Cape, except on the uplands, because the heat is great, especially in Zululand, and the rain comes mainly in the hottest



- season; but the smaller rainfall in winter is usually sufficient for agriculture, as the sun's heat is less, and the summer storms bring with them densely-clouded skies, which shade young plants from the sunshine

## 2 The products vary with the soil and climate.

1. The coast-lands have semi-tropical climate and vegetation, and are generally richly charged with organic matter in the form of decayed vegetation; this helps to keep the soil moist, to assimilate plant-food from the air, and to add to this food by generating carbonic acid
2. These conditions are inimical to Europeans; but the plants which they suit, *e.g.* maize, sugar, and tea, are such as necessitate the use of cheap coloured labour. And, as the Zulus are too proud and the Kaffirs too lazy to do anything except keep cattle, coolies are imported; but wide planting of eucalyptus is greatly improving the climate for Europeans.
3. The 'Midlands' contain a wide stretch of rich loamy soil from Greyton to Richmond, which is adapted for mixed farming. Horses and cattle are raised in large numbers, and are quite free from the lung diseases which affect them on the sugar plantations, and which necessitate the use of mules; the soil is damp enough for maize, especially round Pietermaritzburg, and the climate is dry enough for wheat.
4. The 'Uplands' are naturally most suited to sheep and goats, the goats thriving on the rougher land and requiring the less attention. The climate is, however, not suited to the natives, and, therefore, the mohair trade is—unlike the cattle trade—entirely in the hands of Europeans. These Uplands are, however, most important for the coal which is found in their palaeozoic formation. The best mines are in the upper basin of the Buffalo, especially at Newcastle, Dundee, and Elandslaagte (cf 'Klip-river' coal).
5. Besides the port of Durban, Isipingo and Verulam are sugar centres, and Stanger and Port Durnford are interested in tea-planting; Pietermaritzburg is the commercial centre of the farming, as Ladysmith (the junction for the Orange Free State and Transvaal) is of the mining district.

*NB*—A very large proportion of the coal is 'bunkered' or exported, but the home demand is increasing, mainly owing to the development of the fine Pietermaritzburg iron ores.

### African Islands.

1. MADAGASCAR reproduces the characteristic features of the Great Eastern Plateau.

1. It consists generally of a high plateau surrounded by a low coastal plain ; and the plateau rises towards the east, and then falls abruptly in terraces to a very narrow plain, while on the west it falls gradually to a much wider plain.
2. The height of the plateau and the protection of the lofty water-parting make the climate of the interior temperate and healthy ; trees are rare, and sheep and cattle flourish.
3. As the east coast-lands face the S.E. Trades, they have a very hot, damp, deadly climate, which suits sugar and cotton admirably, *e.g.* between Mekanoro and Tamatave ; and the coral formation along the shore produces splendid pine-apples. The forested eastern escarpment, with its heavy tropical rains and abundance of iron in the soil, is an ideal site for coffee and tea ; and the forest, generally, produces rubber, ebony, and gum-copal. Outside the plateau and the forested region, agriculture is the universal occupation, rice and maize being the chief crops.

*N.B.* —Sugar also flourishes in the Comoro islands, especially in Marotte.

4. The mineral wealth includes copper, sulphur, galena, and gold, as well as an abundance of iron. This accounts for the skill of the people in metal work, especially in gold and silver ; and such skill implies the existence of the metals in considerable abundance, though mining is still undeveloped.
5. The coasts of the southern part of the island, like so much of the African coast, are singularly unbroken ; but in the north there are several fine harbours, the finest being the land-locked bay of Diego Suarez. The chief port at present, however, is Tamatave, as most of the trade is done with the Mascarenes, but Mojanga, with 60 miles of navigation up the Ikopa, is rising in importance.

2. The other 'Indian' islands, like Madagascar, are essentially tropical.

1. Mauritius is a coral-girt, well-wooded area of volcanic hills in the path of frequent cyclones, and it has, therefore, a heavy

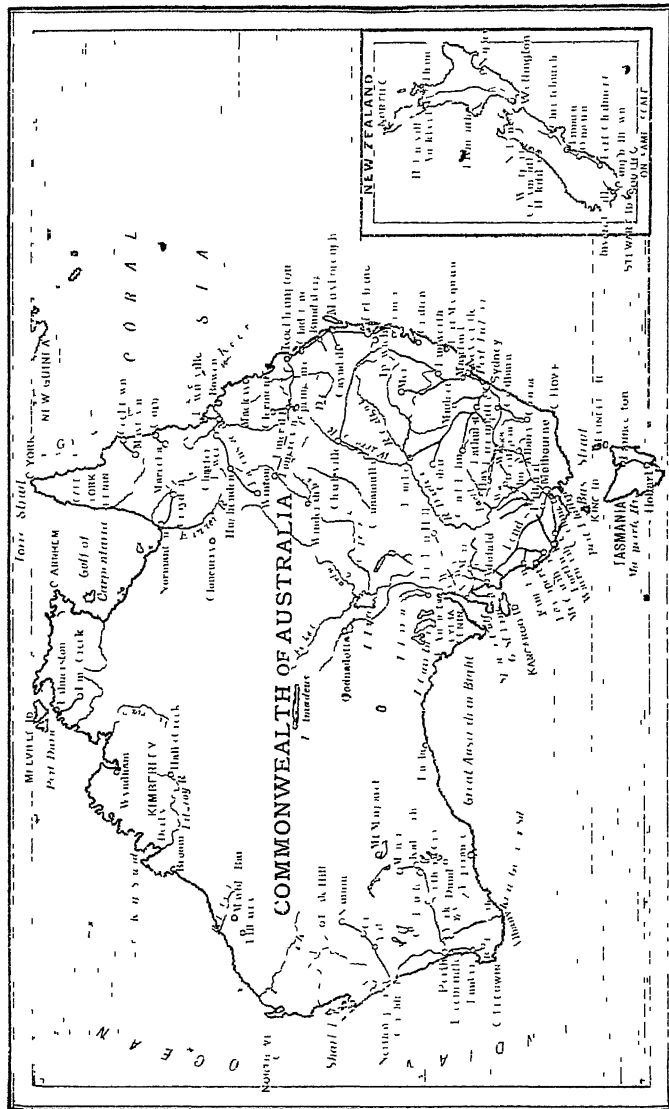
- rainfall, and is an ideal site for sugar. All its towns are ports, and distil rum—Savanna, Mahebourg, Grand River, and the capital of Port Louis
2. Réunion grows various tropical products, including coffee, aloes (for fibril), and vanilla, but, as in Mauritius, the staple is sugar. The great height and the deep gorges of the interior compel each coast-land to export its own product, though there is a railway along the coast, St Denis is the capital; St. Paul and St Pierre serve the west and south.
  3. The Seychelles are the home of the double coco-de-mer, which supplies their export of oil and copra. On the largest island, Mahé, vanilla and excellent tobacco are widely grown, and are exported from Port Victoria
3. The chief 'Atlantic' islands are essentially 'temperate.'
1. The lofty peaks of the Canaries make them famous for goats ('Morocco'), their warm volcanic slopes grow splendid grapes, and their coastlands grow early potatoes and tomatoes (for London) and fairly good tobacco, but the special product is bananas, the old cochineal industry being ruined

*N.B.*—The coaling-station of Las Palmas is more important than Santa Cruz (cigar industries)

2. The dry air and volcanic soil of Madeira produce splendid grapes and other fruit; and its mild climate attracts invalids, especially to the sheltered sunny south coast, *e.g.* to Funchal. This influx of visitors led to a great industry in embroidery and wicker goods, and thousands of pounds worth are exported annually, but the chief exports are 'Madeira' wine and fruit, especially bananas, and cork dust is easily imported from Lisbon

*N.B.*—Cork dust is the best material for packing grapes in because it is very light, it has no taste or smell, and it does not transmit moisture

3. The Azores are typical fruit islands, with a mild even climate and fertile volcanic soil; and their chief exports are oranges and pine-apples, the oranges mainly from St. Michael.
4. Ascension is so devoid of water that it is practically barren; but it is noted for its turtles, which support a 'tortoise-shell' industry, *e.g.* at Georgetown. Cp. the Cape Verde Islands.
5. St Helena is well within the area of the S.E. Trades, and has plenty of rain, but reckless destruction of timber has partly caused and greatly helped the washing away of soil by the rain, so that large areas are practically barren. The chief crop, as in Tristan da Cunha, is potatoes, and the chief industry is fishing, *e.g.* at the coaling-station of Jamestown.



## AUSTRALASIA.

### Australia.

1. THE coast line is singularly unbroken, which affects both climate and commerce adversely.

1. The surrounding oceans, the winds, and the surface, all emphasise the continental rather than the insular element in its climate and productions; but its oceanic isolation emphasises the insular element in its politics and commerce
2. The indentations which do exist, *e.g.* the Gulf of Carpentaria and the Great Bight, have little effect on the 'solidarity' of the whole continent; but warm currents wash the N, E, and S. coasts, which would carry abundant moisture inland if the coasts were broken and the winds blew regularly inland, and which do encourage innumerable forms of marine life, *e.g.* turtles, oysters, sponges, coral, etc., in the shallow waters.
3. The western half of the south coast is an almost unbroken wall of rock for nearly 1000 miles. Albany, on King George's Sound, is the only real harbour, though Esperance Bay may become an important roadstead in connection with the Dundas goldfield. The eastern half is much more broken—Spencer Gulf, the Gulf of St. Vincent, and Port Philip being really valuable harbours; but abrupt cliffs, a heavy swell, and sunken islands make navigation dangerous.

Port Augusta and Port Pirie are fairly good harbours. The former is the outlet for a large pastoral and wheat area, and the terminus of the—unfinished—*Great Northern Railway*, as well as the first great junction on the Perth-Adelaide line. The latter is the chief wheat port of Australia, and has a large through-trade to the N.S.W. silver mines at Broken Hill and Silverton. Port Adelaide has a good natural harbour under the lee of Mount Lofty, and is more

important than it would be if the mouth of the Murray river could be used as a harbour.

Port Philip is, perhaps, the most important harbour in the southern hemisphere. It has an area of 300 square miles, and is very safe, vessels can go up the Yarra into the very heart of Melbourne, and the city monopolises the whole export trade of Victoria in gold, wool, wheat, and butter.

4. The shallow water on the west coast, the cross currents, and the summer hurricanes make navigation very precarious, especially in the north; and the north is also very unhealthy, and has very high tides (46 feet regularly in King Sound). Shark Bay, the only important northern inlet, has a valuable pearl fishery (mainly 'mother-of-pearl'). Cf the pearling stations off Rockbourne and Broome.

*N.B.*—The Alien Act is driving away the 'coloured' divers to New Guinea.

In the south, Geraldton has been made into a fair harbour to accommodate the 'Murchison' metal trade (cf Bunbury and the coal and tin trade, and Busselton and the timber trade). Freemantle has been made into a good harbour to accommodate the trade to and from Perth, and has a large salt industry (Cf. the N W coast of India, p 203).

5. The North coast has a vile climate, but several fine bays. The best is Port Darwin, the harbour of Palmerston, which has excellent accommodation for shipping, and is accessible by the largest vessels in any state of tide or weather. It is the junction of the Overland Telegraph with the Eastern Cable, and the destined terminus of the Transcontinental railway, it has a pearl-fishing industry, and exports the gold, copper, and tin of Pine and Yam creeks.

*N.B.*—The fine harbour of Port Kennedy, Thursday Island, is the headquarters of the pearl-fishing industry.

6. The East coast has special advantages in the possession of some fine harbours and good coal, and the protection of the inshore water for 1200 miles by the Great Barrier Reef.

Brisbane commands the coal and wool trades of South Queensland, Rockhampton commands the gold and cattle trades of Central Queensland, Townsville commands the gold trade of Charters Towers and Ravenswood; Cairns commands the tin trade of Herberton, and exports millions of bananas; Cooktown—opposite the most northerly channel across the Reef—also has a tin trade, and exports rice, sugar, and sea-slugs.

The New South Wales ports are even more important, and some of them are wonderful natural harbours, *e.g.* Botany Bay, Broken Bay, and Port Stephens; but they have been neglected for the artificial coal port of Newcastle and the unique harbour of Port Jackson. The latter is a large, deep and perfectly safe harbour, with a natural wharf of freestone on each side of the promontory on which Sydney stands; it has a splendid climate, immense agricultural and pastoral wealth behind it, and excellent coal and iron on each side.

2. Australia is a huge saucer-shaped plateau, with a rim of low coastland on every side except the south.

1. The edge of the plateau looks from below like a range of hills—rising abruptly from the coastline, only to break off abruptly on to the plateau; and this has a very bad effect on the rainfall inland (*cf.* Africa). And, as the edge of the plateau is very near the sea, the coastal rivers are short and subject to sudden floods, so that along the east coast, where the S E 'Trades' blow directly on to the Great Dividing Range, much havoc is done by the floods to valuable land, and navigation is made impossible or very precarious.
2. As the plateau sinks saucer-like inland, its shape favours the accumulation of water underground in the limestone of which the country is largely composed; but the dry soil and the great heat give surface water very little chance of sinking at all.
3. The low coastlands are the best watered parts of the whole continent, especially in Queensland, where the S E 'Trades' meet the 5000 feet of the Bellenden Ker Mountains.

3. The Great Divide forms much the highest part of the plateau edge, rising in the Alps to twice the height of Snowdon.

1. Even these Alps are practically below the snow-line in such a latitude, and consequently the rivers which flow from them, even the Murray and the Murrumbidgee, though very useful for irrigation, are almost useless for navigation.
2. As this Great *Divide* entirely cuts off damp sea winds from the interior, there are vast areas of desert, and, as the great dryness is naturally accompanied by great and sudden extremes of climate, the deserts are deeply covered with the sand of disintegrated rocks.

4. The distribution of these deserts reflects\* the special characteristics of the surface.

1. As the length of the continent from east to west (nearly 2400 miles) is more than twice its average width from north to south (about 1000), some part of its surface is absorbing the sun's rays vertically in summer for three hours every day; and, owing to the earth's position in perihelion, the sun is 1,500,000 miles nearer to Australia in the 'southern' summer than to the Sahara in the 'northern' summer.

*N B* —The great heat draws in N. monsoons in summer

2. The absence of inland peaks high enough to condense clouds, and the tendency of the plateau edge to stop sea winds entirely or to deflect them into a higher stratum of atmosphere, increase the already excessive heat. The absence of shade still further accentuates the evil, and combines with the radiation from the parched interior to produce severe droughts; and the unevenly distributed rainfall is apt to lead to destructive floods at the end of every drought.
3. As each Tropic in turn is for half the year the centre of a belt of calms, no regular supplies of moisture would be carried to it during that half, even if it were not cut off from wet winds by physical obstacles. Consequently, the Great Sandy Desert lies along one side of it, and the Great Victoria Desert along the other side (Cf the Sahara and the Kalahari deserts in Africa)

5. Most of the indigenous vegetation is, therefore, of a semi-desert nature

1. The desert vegetation consists of plants which, by lengthening their roots, or shortening their height, or thickening their bark, or toughening their leaves, or presenting only the narrow edges of the leaves to the vertical sunlight, or secreting volatile oils, have adapted themselves to draw water from great depths, or to resist the evaporating power of very dry air, *e.g.* cactus, acacia, eucalyptus, salt-bush, mallee-scrub, etc. Cf p. 231
2. The eucalyptus and the salt-bush are particularly important. Both the 'gum' and the timber of the former are very valuable, and millions of sheep are fed on the salt-bush, especially in N.S.W. (cf the Karroo), but the eucalyptus and other native woods, especially jarrah ('sleepers') and karri (paving), are all hardwood, and so not good for building purposes, and droughts are terribly destructive to the sheep.



6. With such a deficiency of rain and rivers inland, agriculture is limited; and, as sheep pasture is less dependent on rain than any other pasture, wool is the greatest Australian product.

1. N S W, which practically monopolises the continental river system, is far ahead of the other colonies in the amount of wool (mainly fine merino) which it produces, and, as both heat and rainfall increase towards the N.E., Queensland is better suited to cattle than to sheep, though the Downs produce good wool, especially round Charleville, Hughenden, and Winton, being greatly helped by artesian water.

*N.B.*—Naturally, Queensland is the great exporter of frozen beef (hides and tallow), N S W of frozen mutton (and wool), and in 1916 wool and skins were exported to a value of over £30,000,000

2. As the heat decreases, but the rainfall increases, towards the S.E., Victoria produces the best wool, especially on the volcanic soil of the Ballarat gold area, and this soil is also well suited for dairy farming, especially round Bonalla.
3. The special conditions on the plateau are very favourable to ostrich-farming, which might be very profitable, and to the development of excellent rabbit-fur for felting—though the rabbits have been a great scourge; and the coastlands in the extreme S.W., especially between Albany and Perth, rear very good horses. Indeed, West Australia generally is proving much less arid than was expected.

7. Agriculture is naturally confined to the edge of the plateau and the coastlands.

1. The cooler and drier plateau edge outside the Tropics produces plants like wheat and the vine, and the latter is particularly profitable. Its long root enables it to resist drought, it requires industry rather than capital, the climate is perfect, and the stony slopes of the downs are an ideal site

The best wine comes from the volcanic valleys of Victoria, *e.g.* Ararat, Mooroopna, and Rutherglen, and the downs of N.S.W., *e.g.* in the Hunter Valley, and Queensland, *e.g.* Roma and Toowoomba—the lower land, where the vines get ‘baked,’ producing the heavier wines; and the best raisins come from the drier area of the Murray basin, *e.g.* Albury, Echuca, Renmark, and Mildura

*N.B.*—N.S.W. is famous for flowers (*cf.* the honey and wax) and fruit, especially the oranges of Parramatta.

2. The tropical coastlands produce specially sugar, maize, and bananas. The sugar naturally prefers the fertile, marly soil and intermittent salt-breezes of the S E 'Trades' coast, especially between Geraldton and Herberton, and round Townsville, Mackay, and Bundaberg. The maize grows most abundantly on the low lands between Brisbane and Rockhampton, and the bananas are specially productive round Cairns.

*N B*—Good cotton, coffee, rice, and other tropical crops are raised, the agricultural products in 1916 being valued at nearly £75,000,000.

8. Australia is very rich in minerals, especially coal, gold, copper, and lead and zinc.

1. Coal exists in abundance along the east coast, and most of it is of very good quality. N.S.W. produces the largest amount and the best quality, the great centres being Newcastle and Illawarra, though Lithgow and Katoomba are also important, and the Illawarra collieries are close to large deposits of magnetic iron (cf. the Lithgow coal and Cadia iron).

*N B*—Other important iron mines are at Mittagong, Rylston, and Wallerawang—the last being of fine magnetite.

Queensland has good coal near Brisbane, especially at Ipswich and Gympie, and at Clermont; and Victoria has a considerable quantity of poor coal in Gippsland.

2. The great gold colonies are West Australia, Queensland, and Victoria. In 'Westialia,' there seems to be gold more or less universally from Hall's Creek, on the Kimberley gold-field, to Dundas, on the Lake Lefroy field—including the De Grey (*e.g.* Marble Bar, Nullagine, and Pilbarra), Ashburton, and Murchison (*e.g.* Yalgeo, Cue, Nannine) districts, but the richest field is in the 'Coolgardie' district, *e.g.* at Coolgardie, Kalbarli, Menzies, Kanowna, Parker, Yilgarn, etc.

The chief gold-fields in Queensland are Charters Towers, Mount Morgan, and Gympie, and the historic mines of Victoria are round Ballarat, Castlemaine, and Bendigo (Sandhurst).

*N B*.—There is a fairly large export of gold from N.S.W., especially from the Cobar district, and the N.S.W. alluvial gold is rich in sapphires.

3. Copper is the characteristic metal of South Australia; it is widely distributed, *e.g.* as far north as Yam Creek, but the richest deposits are now round Moonta and Wallaroo, with the largest copper-smelting works in Australia. A consider

- able amount of copper is mined also in N.S.W., especially at Cobar (where there is also fine malachite) and Nymagee, —in Queensland, *e.g.* at Cloncurry and Mareeba, —and in West Australia, *e.g.* at Northampton (also rich in lead).
4. Tin is the characteristic metal of Queensland, where it is found along the edge of the plateau from Maytown to Stanthorpe; but it is mined also in N.S.W., especially at Tamworth and Vegetable Creek, and in West Australia, *e.g.* at Greenbushes (near which there is also coal).
  5. Silver is the characteristic metal of N.S.W., especially near Broken Hill (mixed richly with lead and zinc) and Silveiton, but it is also found in Queensland, *e.g.* between Ravenswood and Bowen, and in the Lofty Range of South Australia.

*N.B.* —Platinum is also mined in the Fifield district of N.S.W., *e.g.* at Platina.

**9** Apart from the main occupations of mining, stock-raising, and agriculture, there are few industries.

1. The climate in most parts of the continent is essentially unsuited to fine textile work, but the semi-marine climate and the nearness to the Ballarat sheep-pastures have led to a busy woollen industry at Geelong, and woollen industries are spreading round Sydney, especially in Parramatta.
2. Sydney is also the chief leather centre, mainly because of the immense pastures behind it and the widely-spread areas of acacia, or black wattle, the bark of which is exceedingly rich in tannin, and, as in most other towns farther north on the E. coast, the abundance of tallow encourages soap and candle industries.

*N.B.* —Saddlery is the most important 'leather' product.

3. Sydney, again, is the chief centre of furniture-making, the east of N.S.W. supplying abundance of cedar for ordinary purposes, as well as other woods, *e.g.* tulipwood and rosewood, for fine cabinet work. Most of the large towns, especially in Victoria and South Australia, make agricultural machinery.
4. Apart from the reduction of ores on the various metal-fields, and the coming of money in Sydney and Melbourne, there are few metal industries, but there are iron-foundries at Lithgow and Illawarra.
5. Sugar is refined in the coast towns north of Grafton, *e.g.* at Mackay and Bundaberg; wine is made in N.S.W. (*e.g.* between Maitland and Tamworth), Victoria (*e.g.* between

Stowell and Echuca), and S Australia (*eg* round Adelaide), butter is a speciality in Victoria (*eg* at Benalla) and on the N S W coastlands

*N.B* —The large towns have grown, not by absorbing rural population, but by attracting immigrants to supply the labour requisite to handle, *eg*, enormous loads of wood-bales, at places convenient for shipment

### \* Tasmania.

1. THE island is peculiarly favoured in climate, soil, and products.

1. On the north and west coasts the only indentations of commercial value are the Tamar estuary and Macquarie harbour ; but on the south-east coast there are many, the best being the estuary of the Derwent, and everywhere there are valuable fisheries
2. The surface is divided into two high areas by the deep depression of the Tamar, Macquarie, and Coal rivers (cf Caledonian Canal in Scotland) ; and the height, the island position, and the latitude of the Roaring Forties, combine to give it constant 'Brave West Winds,' with a heavy rainfall and an even temperature, which encourage the growth of timber
3. Tin is the characteristic metal, and is worked mainly at Mount Bischoff in the N W, and Branxholme in the N.E ; Macquarie Harbour is the outlet for rich copper, silver (Zeehan), and gold (Lyell) mines , fine iron-ore is mined round Emu Bay, *eg* at Burnie ; and there is good coal in the Fingal and Derwent basins
4. The chief industries are sheep-rearing and fruit-culture (mainly apples, pears, and 'berries'). Hobart, the chief port of the south, has numerous jam factories ; Launceston, the chief port of the north, is the main wool and tin port. Tin is smelted at Launceston, and copper at Macquarie.

### New Zealand.

1. THE latitude, surroundings, and surface of New Zealand are very similar to those of Tasmania.

1. 'Brave West Winds' blow in 'The Roaring Forties' over thousands of miles of sea, and this sea is for many miles westward, *ie* to windward, shallow and warmed by equatorial currents; but the meeting of the cold Antarctic water with this warm equatorial water, the great length of the colony compared with its breadth, and the division into two islands by Cook Strait, cause many parts of the country to be subject to severe gales

*NB*—The heavy rainfall causes the west coasts, especially in the South Island, to be densely forested.

2. In the west of the South Island, where the mountains abut directly upon the shore, there is no commercial harbour, though the firds supply shelter, and in the west of the North Island, where the mountains do not cut off communication inland so entirely, drift sand and the westerly gales spoil the otherwise good harbours, *eg* Manukau. But on the east coast, where the islands themselves give shelter from the westerly gales, there are a number of good harbours—from Russell in the extreme north to Campbelltown in the extreme south
3. The backbone of the colony is the system of parallel mountain ranges which runs from the S W corner up to the N E corner, hugging the west coast—as the Southern Alps—in the South Island, and trending towards the east coast in the North Island, and owing to the narrowness and general hilly character of the country, and to the mountains presenting a full face to the wet west winds, the rivers are so short, rapid, and liable to floods, that even the best of them, the Waikato, is of little use for navigation.

2 Pasture, agriculture, and mining are all important, the pastoral products being very valuable.

1. The insular climate, volcanic soil, and hilly surface are most favourable to English grasses; but much splendid forest has been sacrificed to make room for pasture. Port Lyttelton, Timaru, and Oamaru are the special ports for 'Cantebury' mutton and lamb, but large quantities of 'frozen' meat are exported also from Auckland and Invercargill, and smaller quantities from Gisborne, Napier, and New Plymouth.

New Plymouth is also a dairy centre, exporting butter and cheese, partly collected from neighbouring centres on the line from Wanganui, *eg* Hawera. Dairy industries are also important round all the larger towns in the more temperate latitudes, especially Wellington (famous also for

the Hutt Meat Works) and Christchurch (*eg* between Lincoln and Methven), of the butter of Gore and other towns near Invercargill

Horse-rearing is an important industry in the North Island, especially between Mercer† and Auckland and between Palmerston North and Wellington, and in the oats district of Otago, *eg* between Lumsden and Gore. A good deal of hay is made in the same areas, especially round Mercer, of the export of hay from Napier.

2. Wheat flourishes on the warm, dry plains of Wellington and Marlborough; oats does best in the colder and damper climate of Canterbury and Otago, phormium, or native flax, grows along the low banks of the Waikato

*N.B.*—Barley is grown in both the wheat and the oats areas

3. The chief coal mines are just behind the roadsteads of Westport and Greymouth, where the coal is of excellent quality, and coal is also found in large quantities in the Clutha basin, especially between Roxburgh and Clyde, and in the Waikato basin, *eg* round Mokau and Hamilton. Gold is found, especially round Reefton and Lyell, Kumara and Hohitika; but it is also mined in the Coromandel peninsula and the Clutha valley, *eg* at Cromwell. Amongst the other minerals, Kauri gum (from the sites of old Kauri forests) and sulphur (from the Hot Lakes district, *eg* Rotorua) are most characteristic.

3. Industries have been developed to a wonderful extent for so young a colony, and are naturally connected mainly with the three great occupations of grazing, agriculture, and mining.

1. With coal to the north, between Hawkesbury and Dunbuck, and to the west, *eg* near Outram, Dunedin has made special progress in manufactures. Besides handling (*via* Port Chalmers) much of the gold from the Clutha and Taieri basins, it makes mining and agricultural machinery, and uses the local wool in textile industries
2. Christchurch handles a vast amount of frozen meat and a considerable amount of dairy produce through its fine harbour of Port Lyttelton, and has a number of industries in connection with by-products—*eg* bone-ash, hair, glue, and leather (boots and shoes). The last is specially important, because of the excellence of the (*eg* wattle) tanning materials

*N.B.*—The native tanekaka bark is so valuable for dyeing kid-gloves that it is exported to France for that purpose.

3. Wellington handles a quantity of wool and frozen meat through Port Nicholson, and has growing textile (wool) and meat industries, it has also local materials for pencil and peach-tinning works and for brewing (cf. the hops and barley of Nelson).
4. Auckland, with its twin harbours (of which Waitemata is much the better) and its command of railway traffic up and down the isthmus, is mainly a commercial centre; but it has meat and furniture industries.

### Pacific Islands.

1. NORTHWARD from New Zealand the floor of the Pacific is raised in two great curves, which come to the surface in two lines of islands.

1. The inner, or Melanesian, and outer, or Micronesian, islands are either of low coral or of high volcanic formation (cf. the Bahamas v. Dominica in the West Indies), the coral islanders having to work hard for their living, while the fertile volcanic islands encourage laziness and want of thrift. Their special products are coconut and sago palms, bananas, and breadfruit. Samoa also exports cacao, pine-apples, and limes; but Apia is a dangerous harbour.

*N B*—The best 'Samoa' port, Pago-Pago, belongs to U S A.

2. The Fijis are volcanic mountains, with admirable harbours behind barrier reefs; turtles and pearl oysters haunt the reefs, coco-palms and sugar plantations clothe the coast-lands, and the forested windward sides of the mountains produce immense quantities of very fine bananas. Sugar, copra, and bananas are exported from Suva and Levuka, where there are large distilleries.
3. Of the French possessions New Caledonia is famous for its export of coffee, cobalt, and nickel, Noumea having a good harbour behind the island of Nou, and the New Hebrides have considerable trade in copra (for Marseilles), pearl and turtle shells, and bananas.
4. New Guinea is very well watered, and its largest river—the Fly—is tidal for 100 miles, and more or less navigable for 500. The coasts of the Gulf of Papua produce turtles, pearls, and sea-slugs, and the unhealthy interior produces gold and all kinds of tropical vegetation (including rubber), exported

mainly from Port Moresby. The German territory is being cultivated for cotton and tobacco, and the Dutch coast is famous for sea-slugs, nutmegs, and bird-of-paradise (feathers)

2 Besides these two lines of submarine heights converging on New Zealand, there are two similar lines along the two Tropics

1. The northern centres in the Hawaii group Besides commanding the commercial cross-routes of the central Pacific, this group has peculiar advantages of soil and climate. The ocean currents and the regularity of the N.E. Trades give it a temperature about  $10^{\circ}$  cooler than any equal area in the same latitude; and the heavy rainfall covers the plains and valleys with fertile alluvium from the lofty volcanoes.

The coastal swamps grow immense quantities of rice, the abundance of fresh-water torrents making the quality very good; the sedimentary areas just behind these swamps, especially in Maui and Kauai, are devoted to sugar-cane—the staple-product; coffee and tropical fruit, especially bananas, are important in Hawaii, Kauai, and Maui; cattle and even sheep graze on the mountains

The excellence of the Honolulu harbour, and its central position, make the comparatively small island of Oahu much the most important in the group, but most of the products come from Hawaii, though they are exported *via* Hilo from Honolulu.

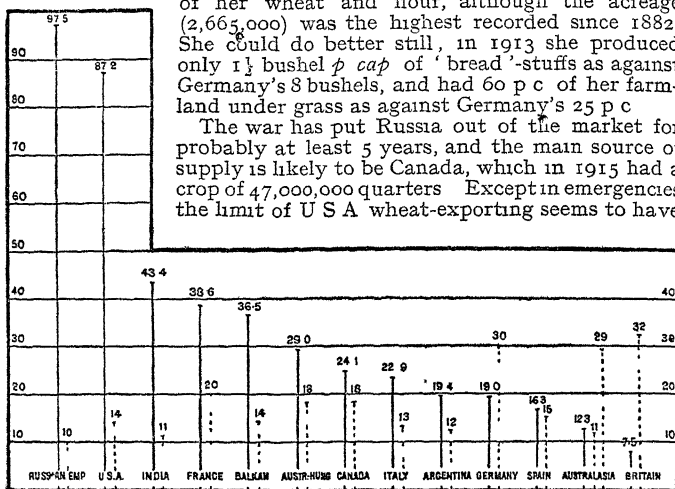
2. The southern, or Paumotu, line produces a large quantity of copra, especially in the Tahiti group; and guano is collected from many of the small islands.



# STATISTICAL APPENDIX

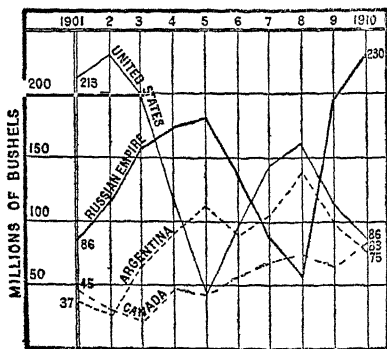
1 WHEAT Britain is much the largest wheat-buyer, importing usually over 25,000,000 quarters, and even in 1918 nearly 65 p c of her wheat and flour, although the acreage (2,665,000) was the highest recorded since 1882. She could do better still, in 1913 she produced only  $1\frac{1}{2}$  bushel *p cap* of 'bread'-stuffs as against Germany's 8 bushels, and had 60 p c of her farmland under grass as against Germany's 25 p c.

The war has put Russia out of the market for probably at least 5 years, and the main source of supply is likely to be Canada, which in 1915 had a crop of 47,000,000 quarters. Except in emergencies the limit of U S A wheat-exporting seems to have



— AVERAGE ANNUAL PRODUCTION IN MILLIONS OF QUARTERS  
 ..... AVERAGE ANNUAL YIELD PER ACRE IN BUSHELS

WHEAT PRODUCTION AND YIELD.



WHEAT. FLUCTUATION OF EXPORTS

been reached, but the wheat area of the Empire is expanding rapidly, having nearly doubled in 20 years, and the quality is excellent, especially in Australia and Canada. In Australia, however, as in India, the yield is very variable—with a variation of 800 p c in the former between 1903 and 1911, and 850 p c in India between 1901 and 1905.

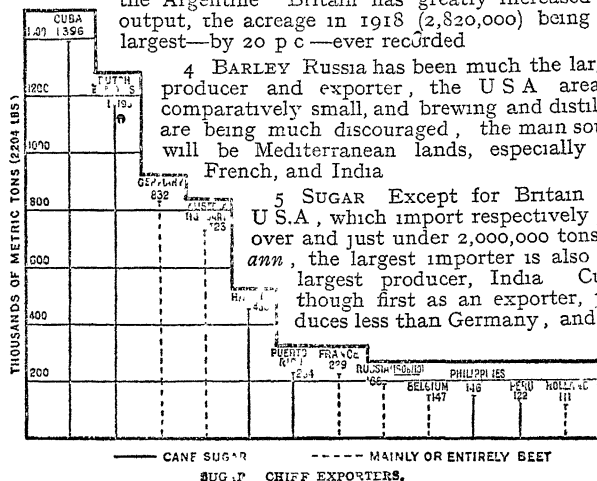
2 MAIZE The chief producer is U S A, with 75 p c. of the total, the chief exporter is Argentina, though she only produces 5 p c ;

Rumania, with a very heavy yield per acre, produces about the same, but the future lies with South Africa

3 OATS Russia, producing very nearly as much as U S A<sup>1</sup>, has been the great exporter, the main source now will be Canada and the Argentine Britain has greatly increased her output, the acreage in 1918 (2,820,000) being the largest—by 20 p c—ever recorded

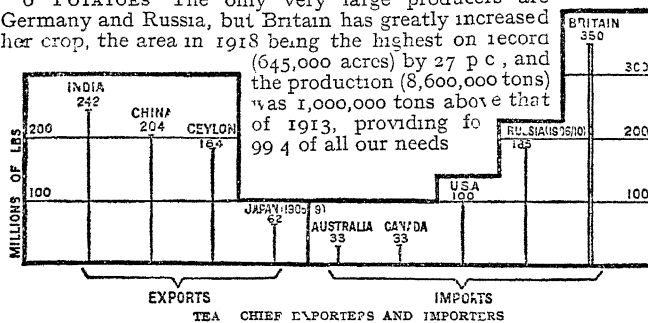
4 BARLEY Russia has been much the largest producer and exporter, the U S A area is comparatively small, and brewing and distilling are being much discouraged, the main source will be Mediterranean lands, especially the French, and India

5 SUGAR Except for Britain and U S A, which import respectively just over and just under 2,000,000 tons *per ann*, the largest importer is also the largest producer, India Cuba though first as an exporter, produces less than Germany, and the



Dutch East Indies, though second in export, produce less than Russia or Austria-Hungary did

6 POTATOES The only very large producers are Germany and Russia, but Britain has greatly increased her crop, the area in 1918 being the highest on record (645,000 acres) by 27 p c, and the production (8,600,000 tons) was 1,000,000 tons above that of 1913, providing for 99 4 of all our needs

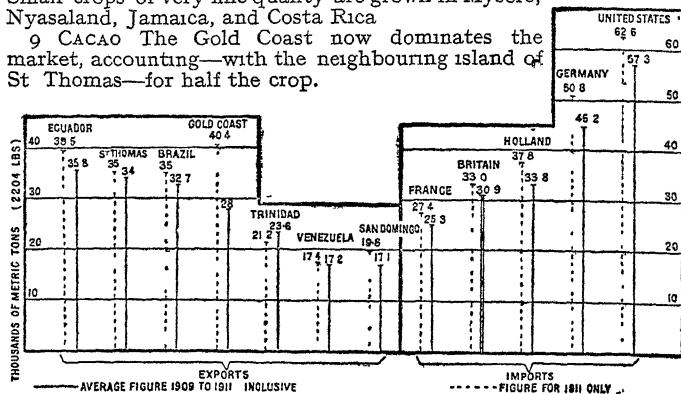


7 TEA Britain consumes fully 42 p c of the world's crop, with a *per cap* consumption of c 6 lb Russia comes second, with 21 p c,

but the *per cap* consumption is only 12 ounces ! The only other consumers worth notice are U S A , 8 p c , Canada, 5 p c , and Australia, 4 p c

8 COFFEE Brazil produces 75 p c of the total , the mass of the rest is more or less equally divided between Colombia and Java, Venezuela and Guatemala, and is of better quality than the Brazilian. Small crops of very fine quality are grown in Mysore, Nyasaland, Jamaica, and Costa Rica

9 CACAO The Gold Coast now dominates the market, accounting—with the neighbouring island of St Thomas—for half the crop.



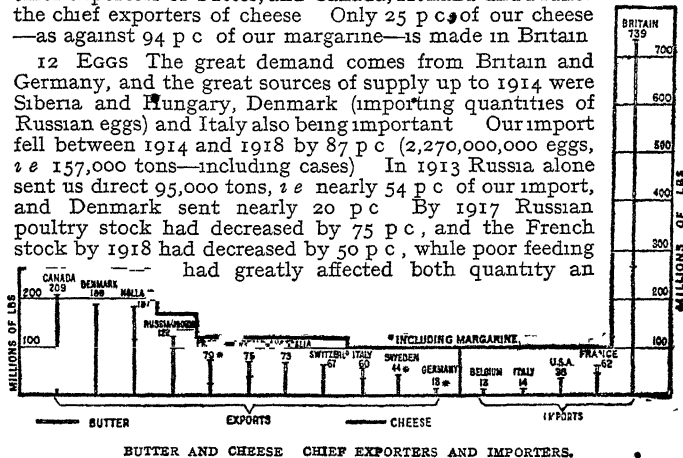
CACAO CHIEF EXPORTERS AND IMPORTERS.

10 SHEEP are most numerous in Australia, Argentina, and U S A , and Australia (600,000,000 lb) and Argentina (400,000,000 lb) are the two great exporters of wool, the former having only 20,000,000 more sheep than the latter. Over 63 p c of the world's merino clip comes from the Empire, while Argentina produces 32 p c of the cross-bred. Exactly a quarter (700,000,000 lb in 1915) of the world's total clip is 'low'-class, and Russia produces 40 p c of it. France, which (like New Zealand) produces c 200,000,000 lb, is the only large exporter that is also a large importer. South Africa and Uruguay produce c 120,000,000 lb apiece, and need practically none of it at home, but the former—like the Australian—is very fine, while the latter—like the Argentine clip—is coarse. Britain imports nearly 800,000,000 lb, France 600,000,000, and Germany over 400,000,000. Belgium imports more than U S A (200,000,000), and Russia was importing fine wool largely (100,000,000) just before the war. New Zealand, Argentina, and Australia are the great mutton exporters.

11 CATTLE India owns 25 p c of the world's cattle (nearly 500,000,000), which accounts for its importance as an exporter of hides, U S A is second in the number of cattle (50,000,000), but imports more hides and skins than any other country except Ger-

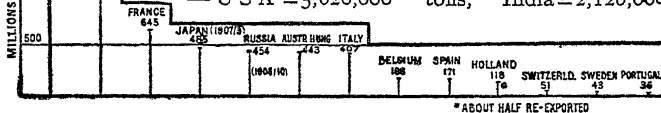
many, and exports more leather than any other country except Germany. Argentina (30,000,000), even without Uruguay, dominates the beef market, but Britain now produces 58 p c of our beef and 57 p c of our butter. Denmark, Russia, and Sweden in 1914 were the chief exporters of butter, and Canada, Holland and France the chief exporters of cheese. Only 25 p c of our cheese—as against 94 p c of our margarine—is made in Britain.

12 Eggs. The great demand comes from Britain and Germany, and the great sources of supply up to 1914 were Siberia and Hungary, Denmark (importing quantities of Russian eggs) and Italy also being important. Our import fell between 1914 and 1918 by 87 p c (2,270,000,000 eggs, *i.e.* 157,000 tons—including cases). In 1913 Russia alone sent us direct 95,000 tons, *i.e.* nearly 54 p c of our import, and Denmark sent nearly 20 p c. By 1917 Russian poultry stock had decreased by 75 p c, and the French stock by 1918 had decreased by 50 p c, while poor feeding had greatly affected both quantity and



quality in Denmark and Holland. In the immediate future we may have to depend largely on Mediterranean lands, *e.g.* Egypt, which was our chief source of foreign supply in 1918, though only able to supply rather over 2 eggs *p cap* of the population.

13 Cotton. U.S.A. grows 70 p c and India 16 p c of the world's crop (10,320,000,000 lb), Egypt (7½ p c) being the only other vital contributor. Russia produces nearly 2½ p c, but uses it all, Brazil produces 1½ p c, and Peru only ½ p c. The world's output of cotton-seed in 1914 was — U.S.A. = 5,620,000 tons, India = 2,120,000,

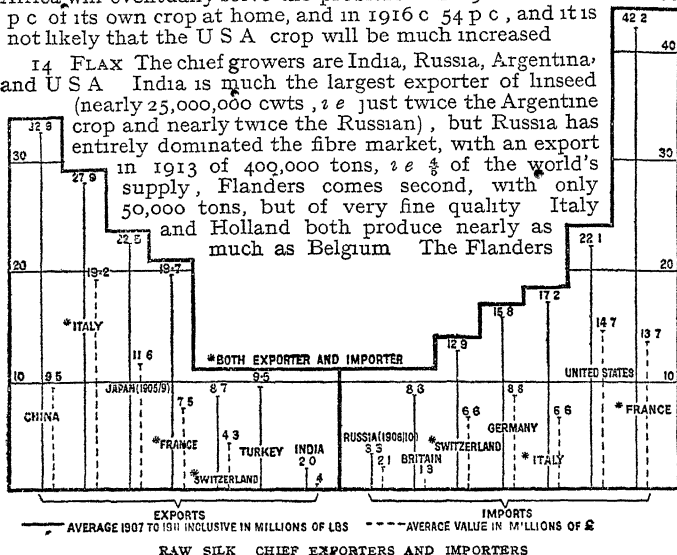


RAW COTTON CHIEF IMPORTERS.

China = 1,600,000, Egypt = 620,000 (nearly all 'bald,' and making 6 p c of the total 11,000,000 tons of seed). The world needs a progressive increase of c 1,000,000 bales *p ann* for several years, (Lancashire alone drawing 3,250,000 bales from U.S.A.), and India

seems to many the only possible source of speedy supply, though Africa will eventually solve the problem. In 1900 U.S.A. used c 35 p.c. of its own crop at home, and in 1916 c 54 p.c., and it is not likely that the U.S.A. crop will be much increased.

14. **FLAX** The chief growers are India, Russia, Argentina, and U.S.A. India is much the largest exporter of linseed (nearly 25,000,000 cwts, i.e. just twice the Argentine crop and nearly twice the Russian), but Russia has entirely dominated the fibre market, with an export in 1913 of 400,000 tons, i.e.  $\frac{2}{3}$  of the world's supply. Flanders comes second, with only 50,000 tons, but of very fine quality. Italy and Holland both produce nearly as much as Belgium. The Flanders

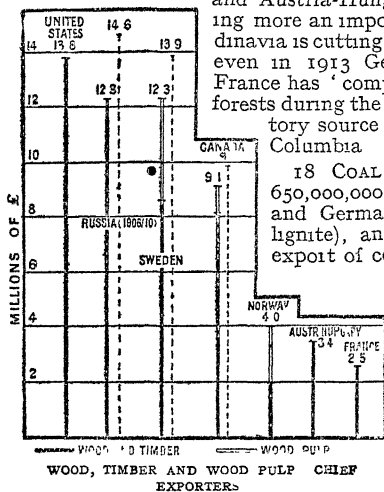


area is much the largest importer, Belgium importing over 3,000,000 lb and France c 1,500,000.

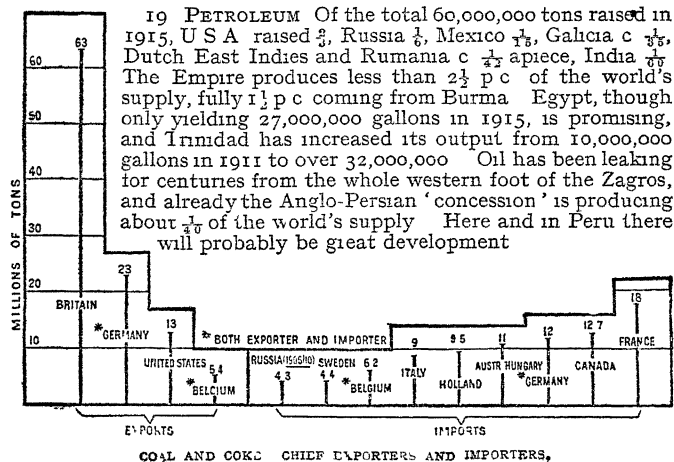
15. **SILK** The output in 1914 was c 50,000,000 lb, China producing 27 p.c., Italy 26 p.c., Japan 25½ p.c., and the export corresponded for quantity. But China silk has only  $\frac{1}{3}$  the value of Japanese, and only half that of Italian. France imports twice as much as U.S.A., but re-exports half of it, and the value is much less.

16. **RUBBER** Since 1911 the Empire has completely dominated the market, producing over half the world's crop. Of the total 200,000 tons for 1914 the Federated Malay States provided c 30 p.c., the Straits Settlements 24 p.c., India and Ceylon 12½ p.c. Brazil produces only 19 p.c., but all 'wild', and the Dutch East Indies produce 10 p.c. The total output for 1917 was 250,000 tons, of which U.S.A. took just under 70 p.c. (70 p.c. of which was used for motor tyres, solid and pneumatic), and Britain just over 10 p.c., and the value of the dependent manufacture may be put at £1,000,000 per 1000 tons. Empire rubber is almost all 'plantation,' which is more variable than 'wild' in vulcanising and milling properties. West Africa, which already produces 8 p.c. of the world's supply, and Burma are very promising.

17 **TIMBER** The largest exporters before the war were Russia (including Finland), Scandinavia (Sweden over  $\frac{1}{3}$ ), U.S.A., Canada, and Austria-Hungary. But U.S.A. is becoming more an importer than an exporter, Scandinavia is cutting about the possible maximum; even in 1913 Germany was importing, and France has 'completely' cut some of her best forests during the war. The only quite satisfactory source is Canada, especially British Columbia.

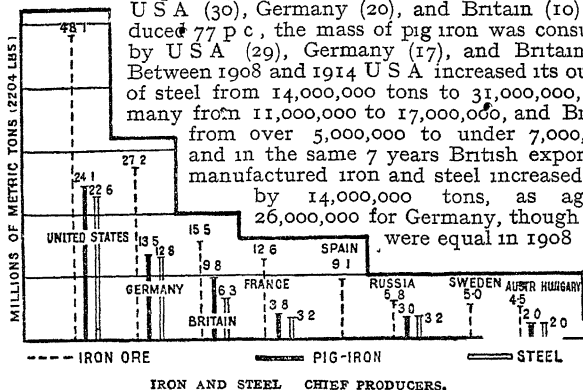


18 **COAL** In 1918 U.S.A. produced c. 650,000,000 tons, Britain over 250,000,000, and Germany over 150,000,000 (besides lignite), and to us at present a large export of coal is absolutely essential for cheap import of food and raw materials. In 1913 the monthly average output in Britain was 23,953,000 tons, as against 42,408,000 in U.S.A., in 1918 it was 18,999,000, as against 50,993,000 in U.S.A. There are signs, however, that the U.S.A. output is falling slightly.

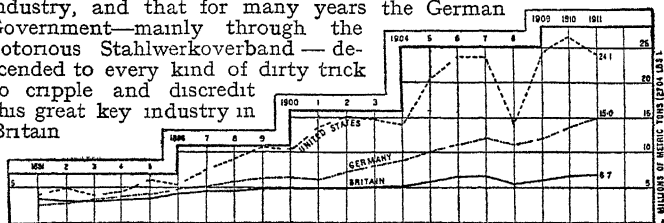


COAL AND COKE CHIEF EXPORTERS AND IMPORTERS,

20 IRON In 1914 the annual output of ore was reckoned at fully 150,000,000 tons, of which U S A produced  $\frac{1}{3}$ , Germany  $\frac{1}{4}$ , France  $\frac{1}{8}$ , Britain  $\frac{1}{10}$ , Spain  $\frac{1}{10}$ , Russia  $\frac{1}{10}$ , Sweden  $\frac{1}{10}$ . Now France should produce  $\frac{1}{8}$ , and Germany perhaps  $\frac{1}{8}$  (theoretically  $\frac{1}{10}$ ). The average output of pig iron was c 72,000,000 tons, of which U S A (30), Germany (20), and Britain (10) produced 77 p c, the mass of pig iron was consumed by U S A (29), Germany (17), and Britain (8). Between 1908 and 1914 U S A increased its output of steel from 14,000,000 tons to 31,000,000, Germany from 11,000,000 to 17,000,000, and Britain from over 5,000,000 to under 7,000,000, and in the same 7 years British exports of manufactured iron and steel increased only by 14,000,000 tons, as against 26,000,000 for Germany, though they were equal in 1908



At the same time, what all the world knows now, should be kept in mind. That probably no British industry has suffered more from German competition than the iron and steel industry, and that for many years the German Government—mainly through the notorious Stahlwerkverband—descended to every kind of dirty trick to cripple and discredit this great key industry in Britain.



STEEL PRODUCTION IN THE THREE LEADING COUNTRIES

21 RARE 'EARTHS,' ETC Tungsten, nickel, manganese, and monazite are connected with 'key' industries. In 1914 the Empire produced 40 p c of the world's tungsten, the wolfram mines of Burma being very rich, and we used 50 p c of the refined tungsten. Germany then controlled 75 p c of the refining, as against our 6 p c, but in 1917 we controlled over 67 p c (13,000 tons). In 1914 over 77 p c of the world's nickel came from the Empire, nearly all from Canada (22,177 tons), and Britain used nearly 33 p c, but we refined

only 18 p c , while Germany—with a production of only  $1\frac{1}{2}$  p c —refined over 17 p c The position in regard to manganese was equally bad, though India sent us nearly 400,000 tons as compared with 260,000 from the rest of the world (240,000 of it from Russia) So 50 p c of the monazite sands of the world were found in the Empire, mainly in Travancore , but 60 p c of the extraction was done in Germany, and *none* in Britain, while 80 p c of the gas-mantles used in Britain were German—30 p c made by German firms in this country and 50 p c made in Germany.



## INDEX

Aachen, 75, 76.  
 Aalborg, 64  
 Aarhuus, 64  
 Abbeville, 48  
 Aberdeen, 28, 30, 40.  
 Abo, 68  
 Abruzzi, 88  
 Abu Hammad, 237  
 Abyssinia, 227, 238, 241, 244  
*Acacia*, 231  
 Acapulco, 150, 152.  
 Accrington, 34  
 Adalia, 190.  
 Adamawa, 244  
 Adam's Bridge, 205  
 Adam's Peak, 205  
 Adana, 191  
 Addis Abeba, 244.  
 Adelaide, 258, 265  
 Aden, 11, 21, 193, 244  
 Adige, R., 43, 78, 80, 88, 92.  
 Adra, 96  
 Adrar, 239  
 Adriatic, 76, 79, 88, 92  
 Adua, 244  
 Aegean, 99, 101, 190  
 Aegina, 1, 98  
 Afghanistan, 195  
 Agades, 236.  
*Agave*, 151, 162.  
 Agra, 203  
 Agram, 80  
 Aguas Calientes, 153.  
 Aguadilla, 162.

Agulhas, C , 225, 251.  
 Ahmadabad, 201, 203, 204  
 Aidin, 191  
 Aigun, 217  
 Ain Sefra, 236.  
 Air, 239, 240  
 Airdrie, 34  
 Aire, R , 35, 36  
 Aix-la-Chapelle, 76.  
 Alabama, 139, 141.  
 Alais, 49  
 Alajuela, 157  
 Alapalli, 201  
 Alaska, 13, 103, 106, 110, 117, 120, 139.  
 Albania, 99  
 Albany (U.S.A ), 109, 138, 143  
 Albany (W A.), 250, 258, 262  
 Alberta, 117, 121, 129  
 Albury, 262  
 Alcoy, 96  
 Alegre, Porto, 181  
 Alessandria, 87, 89  
 Aleppo, 192  
 Alexandria, (Eg ) 4, 21, 228, 238.  
 Alexandria (U K ). 34.  
*Alfa*, 231, 236  
 Alfred, Port, 250  
 Algarve, 97  
 Algeria, 49, 234, 235  
 Algiers, 21, 235, 236  
 Algoa Bay, 250.  
 Algoma, 128.

Alibet, 221.  
 Alicante, 95, 96.  
 Alkmaar, 58  
 Allahabad, 10, 198, 203  
 Alleghany, 142  
 Alleghany Mts , 134, 136, 138, 139, 147  
 Alleghany, R , 109, 139.  
 Allentown, 146  
 Allen, Lough, 25.  
 Alleppi, 201  
 Aller, R , 74  
*Allspice*, 159, 161.  
 Almaden, 46, 96, 116.  
 Alma Dagh, 192  
 Almeria, 21, 45  
*Aloe*, 244, 256  
 Alps, 42, 43, 84, 87, 88.  
 Alsace, 73, 74, 75  
 Altai Mts , 186, 217.  
 Alwar, 204  
 Amapala, 156  
 Amazon R , 165-168, 180  
 Ambaca, 244.  
 Ambalena, 171.  
*Amber*, 70  
*Ambergris*, 162  
 Amboina, Is , 223.  
 Ambriz, 243.  
 Ambrizette, 213.  
 Amiens, 50, 51  
 Ammeberg, 62.  
 Amoy, 216  
 Amritsar, 203  
 Amsterdam, 51, 59.  
 Amu, R., 219.

- Amur R, 186, 217, 221  
 Anaconda, 140  
 Anatolia, 17, 190, 191  
 Ancona, 92  
 Andaman Is., 205  
 Andes, 1, 2, 3, 166.  
 Andijan, 220.  
 Angara, R., 187.  
 Angola, 243  
 Angora, 191.  
 Angostura, 182  
 Angoulême, 49  
 Angra Pequena, 248.  
 Ankobar, 244  
 Annam, 207  
 Annapolis, 125.  
 Annonay, 51.  
 Ansifer, 217.  
 Ansonia, 144.  
 Anti-Atlas Mts, 234.  
 Antigua, 158, 159  
 Antioquia, 171.  
 Antisana, Mt, 172  
 Anti-Taurus Mts, 191  
 Antivari, 102  
 Antofagasta, 174, 175.  
 Antrim, 34.  
 Antwerp, 53, 55.  
 Anzin, 49.  
 Aomori, 209, 210.  
 Apari, 222  
 Apeldoorn, 59  
 Apennine Mts, 87-91  
 Apia, 268.  
 Appalachian Mts, 106  
*Apples*, 27, 48, 85, 125,  
 126, 137, 265.  
 Apulia, 88, 89  
 Arabia, 16, 21, 192.  
 Aracaju, 181  
 Aragon, 94.  
 Ararat, Mt., 262  
 Aravalli Hills, 202.  
 Arauco, 176  
 Arbroath, 38.  
 Arcachon, 46.  
 Arctic Ocean, 105, 187  
 Ardennes Hills, 41,  
 47, 50, 53, 54, 76  
 Arecibo, 162  
 Arequipa, 173  
 Argentina, 26, 29, 177.  
 Argun, R., 187.  
 Arica, 175.  
 Arta, 210.  
 Arlberg Pass, 78, 84,  
 86.  
 Armenia, 195.  
*Arnatto*, 163.  
 Arnheim, 58, 59.  
 Arno, R., 88  
 Aroa, 183  
*Arrowroot*, 160, 181.  
 Arta, 99  
 Aruwimi, R., 228.  
 Asben, 239  
 Ascension I., 256.  
 Ascotan, 174.  
 Ashby, 36.  
 Ashio, 209.  
 Ashland, 139  
 Ashtabula, 139  
 Asia Minor, 188, 190.  
 Askhabad, 194, 220.  
 Aso-san, Mt, 208.  
*Asphalt*, 92, 162.  
 Assam, 201-203.  
 Assen, 59  
 Assiniboine, R., 125  
 Assuan, 228, 237  
 Asterabad, 194  
 Astoria, 22, 117, 144  
 Astrakhan, 68, 69.  
 Attleboro', 145  
 Asturias, 96, 97  
 Asuncion, 179, 180  
 Atacama, 3, 168, 175  
 Atbara, R., 4, 228.  
 Atchison, 143  
 Athabasca, L., 121.  
 Athens, 102  
 Atlanta, 141.  
 Atlantic Ocean, 93, 103,  
 111, 118, 134  
 Atlas Mts, 230-233.  
 Atrato, R., 171.  
 Attalia, 190  
 Attock, 198  
 Auckland, 266-268  
 Augusta, 106, 141  
 Augusta, Port, 258  
 Aujula, 240  
 Australian Desert, 261.  
 Auvergne, 52  
 Avalon, 131  
 Aveyron, 49  
 Avon, R., 24, 32.  
 Avignon, 51.  
 Aviles, 97  
 Ayavaca, 173.  
 Ayr, 36, 37, 38.  
 Ayr R., 25  
 Ayuthia, 206.  
 Azores, Is., 93, 256.  
 Azov, Sea, 69.  
 Babylonia, 191.  
 Baccarat, 52  
*Bacon*, 12, 18, 30, 46.  
 Bacup, 37.  
 Baden, 76.  
 Bagamoyo, 245  
 Baghdad, 191.  
 Bahama Is., 158, etc.  
 Bahia, 22, 181  
 Bahia Blanca, 178.  
 Bahrein, I., 193  
 Bakal, L., 221  
 Baku, 14, 46, 194.  
 Balaton, L., 79.  
 Bâle, 85, 86  
 Balearic Is., 93, 95  
 Balkan Mts, 98-102  
 Ballarat, 262, 263, 264.  
 Baltic Sea, 32, 38, 43,  
 60, 63, 70  
 Baltimore, 19, 22, 106,  
 139, 144, 145  
 Baluchistan, 187, 195.  
 Bamako, 242  
 Bamberg, 71  
*Bamboo*, 202-214, 245.  
 Banana, 243.  
*Banana*, 155-159, 170,  
 241, 245, 268, 269.  
 Banat, 78  
 Banda Is, 223  
 Bandar Abbas, 194.  
 Bandawe, 246, 247.  
 Banff, 127.  
 Bangala, 243  
 Bangalore, 204  
 Bangkok, 21, 206.  
 Bangweolo, L., 228.  
 Banjermasin, 223  
 Banka I., 59, 223.  
 Baracoa, 160  
 Barava, 244.  
 Barbados, I., 158, 163.  
 Barbary States, 234.  
 Barberton, 249  
 Barcelona, 21, 42, 93.  
 Bareilly, 202.  
 Bari, 91  
 Barkul, 217.

- Barley*, 12, 21, 26, 64,  
 74, 89, 125, 136, etc.  
*Barmen*, 71.  
*Baroda*, 201, 203  
*Barquisimeto*, 183  
*Barrancas*, 182  
*Barranquilla*, 171.  
*Barrels*, 138, 143  
*Barrow*, 34, 35  
*Bartica*, 182  
*Basra*, 21, 191.  
*Basutoland*,  
*Batavia*, 223  
*Bath (U.K.)*, 28  
*Bath (U.S.A.)*, 142  
*Batley*, 36  
*Batna*, 235.  
*Battambang*, 206.  
*Batum*, 14, 21, 69  
*Bavaria*, 12, 74, 75, 76.  
*Bay City*, 144.  
*Bayonne*, 42, 47  
*Beans*, 21, 155, 170,  
 180, 213-215, 238.  
*Beaufort*, 144.  
*Beaune*, 48  
*Beauvais*, 48, 50.  
*Bechuanaland*, 247.  
*Beef*, 12, 13, 30, 46,  
 178, 179, 262  
*Beer*, 17, 40, 48, 55,  
 64, 74, 80, 125, 204  
*Beetroot*, 16, 49, 55, 59,  
 61, 67, 73, 80, 146  
*Behar*, 201, 203  
*Beira*, 246, 247.  
*Beirut*, 21, 192  
*Beja*, 96  
*Belem (Para)*, 180.  
*Belfast*, 30-38  
*Belgium*, 2, 46.  
*Belgrade*, 10, 101, 102  
*Belize*, 156.  
*Bellary*, 201.  
*Belle Isle Strait*, 109  
*Belt, The Gt.*, 63.  
*Benalla*, 265.  
*Benares*, 198, 203  
*Bendigo*, 263  
*Benghazi*, 236, 240.  
*Benguela*, 225, 243, 251.  
*Benicarlo*, 96.  
*Benisaf*, 233, 235  
*Ben Nevis*, 71, 106, 198  
*Bennington*, 145.  
*Benue, R.*, 229, 244.  
*Berar*, 201  
*Beraun*, 83  
*Berber*, 228, 237,  
*Berbera*, 244.  
*Berdiansk*, 69  
*Bergamo*, 15, 89.  
*Bergen*, 44, 60, 61.  
*Berkeley*, 25  
*Berlin*, 10, 72, 75, 76  
*Bermuda Is.*, 132  
*Bern*, 86  
*Besançon*, 52.  
*Bessarabia*, 67, 69.  
*Bethel*, 140, 141  
*Bethesda*, 40.  
*Bethlehem*, 145, 250.  
*Bhamo*, 199  
*Biddeford*, 141.  
*Bielefeld*, 76  
*Biella*, 90.  
*Bihé*, 243  
*Bilbao*, 34, 93, 96, 97.  
*Billiton I.*, 59, 223.  
*Bilma*, 239, 240.  
*Bilston*, 35  
*Bingen*, 71.  
*Birkenhead*, 37  
*Birmingham (U.K.)*,  
 28, 35, 36  
*Birmingham (U.S.A.)*,  
 138, 139  
*Biskra*, 235, 236.  
*Bitolia*, 99  
*Biwa, L.*, 211  
*Bizerta*, 236.  
*Blackburn*, 34.  
*Black Forest*, 72, 77  
*Black Sea*, 98, 186, 190.  
*Blankets*, 36.  
*Blantyre*, 246.  
*Bleiburg*, 81  
*Blewfields*, 155  
*Bloemfontein*, 250  
*Bocchetta Pass*, 91  
*Boden*, 62  
*Bogota*, 171.  
*Bohemia*, 46, 76-83  
*Bohemian Forest*, 81.  
*Boksburg*, 249  
*Bolan Pass*, 195, 197.  
*Bolivar*, 174, 175, 177  
*Bologna*, 89, 91.  
*Bolton*, 34.  
*Boma*, 227, 243.  
*Bombay*, 196-204.  
*Bona*, 235  
*Bonalla*, 262.  
*Bones*, 13.  
*Bonn*, 71.  
*Bontuku*, 242  
*Boots*, 37, 51, 130, 143  
*Bordeaux*, 47, 48, 50.  
*Borku*, 239  
*Borneo I.*, 223  
*Bornholm*, 63  
*Bornu*, 241.  
*Bosnia*, 78, 81.  
*Bosphorus*, 100  
*Boston*, 22, 138, 141, 147.  
*Bottles*, 52.  
*Boulogne*, 47, 48.  
*Bowen*, 264.  
*Bradford (U.K.)*, 24,  
 36, 38.  
*Bradford (U.S.A.)*,  
 115, 139.  
*Brahmaputra, R.*, 199,  
 201  
*Braila*, 21, 101.  
*Brandon*, 145  
*Brantford*, 130.  
*Branxholme*, 265.  
*Brazil*, 16, 22, 165, 180.  
*Bremen*, 15, 70.  
*Bremerhaven*, 70.  
*Brenner Pass*, 76, 78  
*Brescia*, 90,  
*Breslau*, 42, 72-78.  
*Brest*, 47.  
*Bridgetown*, 163.  
*Bridgewater*, 40.  
*Brie*, 48.  
*Brindisi*, 22, 91, 92.  
*Brisbane*, 259, 263  
*Bristol*, 24, 35, 36, 37.  
*British Honduras*, 156.  
*Bnto*, 157.  
*Brockton*, 143  
*Broken Hill*, 258, 264  
*Broseley*, 40.  
*Bruges*, 53, 54, 55  
*Brunn*, 44, 80, 83  
*Brunswick*, 73, 74  
*Brusa*, 181.  
*Brussels*, 53, 54, 55  
*Bucharest*, 101  
*Budapest*, 42, 80, 82.  
*Budweis*, 82.  
*Buenaventura*, 171.

- Buenos Aires, 22, 177.  
 Buffalo, 3, 142, 145  
 Buffalo R., 4, 254  
*Building-stone*, 28, 90, 146, etc.  
 Bukhara, 10, 195, 220  
 Bukovina, 46, 78, 81  
 Bulgaria, 102  
 Buluwayo, 247  
 Bundaberg, 263, 264  
 Bargas, 97, 100, 102  
 Burma, 197-203, 206.  
 Burnie, 265.  
 Burnley, 34.  
 Burra, 263  
 Burrard Inlet, 120.  
 Burslem, 40  
 Burton, 4, 25, 26, 40.  
 Bury, 34  
 Bushire, 21, 194.  
 Busselton, 259  
 Butte City, 139, 140.  
*Butter*, 13, 30, 48, 55, 58, 64, 85, 129, 178, 220, 262, 265, 266  
 Butuan, 222.  
 Cabinda, 243  
*Cabinet-wood*, 18, 27, 45, 61, 66, 72, 81, 85, 113, 123, 137, 155, 160, 168, 188, 202  
*Cacao*, 16, 152, 159, 168, 170, 180, 182  
 Cadiz, 10, 22, 93, 95, 96.  
 Cagliari, G., 90.  
 Caicos, Is., 161.  
 Cairns, 259, 263  
 Cairo, 4, 238  
 Calais, 22, 47  
 Calcutta, 11, 196-204  
 Caldera, 175  
 Caledon, R., 250  
 Calgary, 127, 129.  
 Calicut, 198, 203.  
 Callao, 173, 182.  
 Caltanissetta, 90  
 Cambodia, 207  
 Cambrai, 51  
 Camden, 141, 144  
*Camel's-hair*, 189, 193, 195, 220, 232  
 Camembert, 48  
 Camocim, 180  
 Campagna, 87.  
 Campbelltown, 266.  
 Campeachy, 150  
*Camphor*, 207, 223.  
 Campine, 53, 55  
 Canary Is., 256  
 Canterbury Plains, 12  
 Canton, 21, 214-216  
*Caoutchouc*, 180  
 Cape Breton I., 126.  
 Cape Coast Castle, 242  
 Cape Colony, 231, 450.  
 Cape Town, 250, 251.  
 Carabaya, 173.  
 Caracas, 183  
 Caravellas, 181.  
 Cardamom Mts., 198.  
 Cardiff, 10, 35  
 Cardona, 96  
 Cariboo, 127  
 Carib Sea, 104, 160.  
 Carinthia, 81, 82.  
 Carlisle, 42  
 Carlsruhe, 74  
 Carmel, Mt., 192.  
 Carmen, 150  
 Carpathian Mts., 42.  
 Carpentaria, G., 258  
*Carpets*, 36, 54, 69, 100, 141, 191, 195, 203, 211, 236.  
 Carrara, 90  
 Cartagena (Col.), 171  
 Cartagena (Spain), 96  
 Cartago, 156, 157  
 Cascade Mts., 114  
 Caspian Sea, 46, 66-69, 194  
*Cassava*, 160, 232  
 Cassel, 71  
 Cassiquiare, R., 167.  
 Castlemaine, 263  
 Catamarca, 178.  
 Catania, 10, 89, 90  
 Cattaro, 78  
*Cattle*, 13, 25, 46, 117, 155, 169, 220, 241, 254, 262, 266  
 Caucasus Mts., 1, 42.  
 Cawnpur, 198, 201, 203.  
 Cayenne, 182  
 Cayman Is., 159, 161.  
 Ceara, 180  
 Cebu, I., 222  
 Ceibo, 156  
 Celebes, I., 223.  
 Cenis, Mt., 42, 47, 91.  
 Cephalonia, 99.  
 Ceram, 223  
 Cerro de Pasco, 173.  
 Cetta, 21, 48, 49  
 Cevennes Mts., 50, 52.  
 Ceylon, I., 6, 16, 205  
 Chablis, 48  
 Chad, L., 226, 230  
*Chalk*, 40, 49, 63  
 Chalmers, Port, 267.  
 Chalons, 48  
 Champagne, 48.  
 Champerico, 155  
 Champlain, L., 109, 119.  
 Chang-sha, 215.  
 Chapra, 203.  
 Charente, 17.  
 Charju, 220.  
 Charleroi, 54.  
 Charleston, 15, 106, 143.  
 Charleville, 262.  
 Charlottetown, 119.  
 Charter, 247  
 Charters Towers, 263  
 Chaudière Falls, 124.  
 Chavigny, 49.  
 Cheddar, 30  
*Cheese*, 13, 38, 48, 58, 73, 85, 88, 129, 136.  
 Chekiang, 15, 214.  
*Chemicals*, 36, 37, 54, 75, 145  
 Chemnitz, 73, 75.  
 Chemulpo, 218.  
 Cheng-tu, 214, 215.  
 Cherbourg, 47  
 Cherra Punji, 200  
 Chesapeake Bay, 117, 142, 144.  
 Chester, 141.  
 Cheviot Hills, 29  
 Chianti, 89  
 Chiavari, 91.  
 Chicago, 142-144, 148.  
 Chieng-Mai, 206.  
 Chile, 170, 175.  
 Chililaya, 174  
 Chillan, 176  
 Chiloe Is., 175  
 Chiltern Hills, 37.  
 Chimbo, 172  
 Chimboraço, Mt., 172.  
 Chimbote, 173  
 China Sea, 185.

- Chinandega, 157.  
 Chinaz, 220  
 Chindé, 229, 246.  
 Chingan, 216  
 Chinkiang, 215  
 Chita, 221  
 Christchurch, 267.  
 Christiania, 61  
 Cholon, 207  
 Chung-king, 212, 215  
 Churchill, R., 104.  
 Cider, 27, 40, 48  
 Cienfuegos, 160  
 Cilicia, 191  
*Cinchona*, 168, 172,  
     174, 201, 205  
 Cincinnati, 142, 144  
*Cinnamon*, 205  
 Ciudad Juarez, 150  
 Ciudad Real, 97  
 Civita Vecchia, 92.  
 Clay, 40, 46, 59, 75, 83,  
     91, 96, 145, 214  
 Cleveland, 139, 145  
 Clocks, 35, 52, 86  
 Cloncurry, 264  
 Cloves, 223, 245.  
 Clyde, 267.  
 Clydebank, 34.  
 Coal, 14, 27, 45, 114,  
     175, 189, 202, 233,  
     263, 267.  
 Coatbridge, 34  
 Coatzacoalcas, 150.  
 Coban, 155  
 Cobar, 263, 264  
 Coblenz, 44, 71.  
 Coburg, 72, 83.  
 Cochabamba, 174.  
 Cochon China, 207.  
*Cochineal*, 151, 256.  
 Cochrane, 127  
*Cocunut*, 156, 162, 183,  
     189, 205, 206, 222,  
     241, 256, 268  
 Cod, 13, 30, 60, 123,  
     130, 132  
*Coffee*, 16, 152, 155,  
     159, 171-4, 181, 201,  
     223, 232, 241-5, 255.  
 Cognac, 48  
 Cohoes, 141  
 Combatore Pass, 198.  
 Colchester, 10, 30.  
 Colima, 171.  
 Collingwood, 130  
 Cologne, 44, 71, 75-77.  
 Colombia, 163, 170  
 Colombo, 205  
 Colonia, 179  
 Colquechaca, 174.  
 Columbia, 106  
 Columbia R., 107, 127.  
 Comayagua, 156  
 Comox, 120, 126  
 Compiègne, 52  
 Concepcion (Arg.), 179  
 Concepcion (Chil.), 176  
 Congleton, 38  
 Congo Free State, 243  
 Congo River, 226-230  
 Conneaut, 139  
 Connecticut, R., 108,  
     147  
 Connelssville, 138.  
 Constance, 86.  
 Constantia, 251  
 Constantine, 235  
 Constantinople, 19, 100  
 Cook Strait, 266  
 Cooktown, 259  
 Coolgardie, 10, 263  
 Coorg, 201  
 Copenhagen, 63, 64  
 Copiapo, 175  
*Copper*, 46, 114, 116,  
     169, 176, 209, 214,  
     215, 221, 253, 263  
 Coquimbo, 175.  
 Cordoba, 178  
 Cordova, 94, 96.  
 Corfu, 44, 99  
 Corinth, 19, 99, 102.  
 Corinto, 157.  
*Cork*, 95, 234-6, 256.  
 Coromandel, 197, 203  
 Coronel, 176.  
 Corrientes, 178.  
 Cortez, 156.  
 Coruña, 97.  
 Costa Rica, 155, 157.  
 Côte d'Or, 17  
 Cotopaxi, Mt., 172  
 Cotswold Hills, 29, 36  
*Cotton*, 15, 33, 51, 55,  
     59, 67, 69, 75, 86, 89,  
     113, 114, 135, 140,  
     152, 168, 180, 189,  
     194, 201, 209, 213,  
     214, 220, 238, 241.  
 Courtrai, 54, 55.  
 Coventry, 38  
 Cracow, 46, 82  
 Cradley Heath, 35.  
 Cremona, 88, 89, 91.  
 Crete, 190  
 Creuzot, 49, 51, 52.  
 Crewe, 35  
 Cripple Creek, 139.  
 Cromwell, 267  
 Crow Nest Pass, 127.  
 Cuba, 16, 17, 104, 159.  
 Cuenca, 172  
 Cumberland, 138.  
 Curaçoa, 59, 163  
*Currents*, 99  
*Cutlery*, 35, 52, 75, 90,  
     96, 129, 144.  
 Cuttack, 203.  
 Cuxhaven, 70.  
 Cuyaba, 181  
 Cuzco, 173, 174.  
 Cyprus, 1, 190  
 Cyphergat, 252  
 Dacca, 203  
 Daiguin, 160.  
 Dakar, 242  
 Dakhel, 237.  
 Dal Arne, 62.  
 Dallas, 12  
 Dalkeith, 37.  
 Dalmatia, 78, 81.  
 Dalmi, 221  
 Damara, 248  
 Damascus, 10, 192  
 Damietta, 238  
 Dannemora, 10, 62.  
 Danube, R., 44, 70-82,  
     98  
 Danzig, 72, 74, 76.  
 Dardanelles, 100.  
 Dar-el-Beida, 235.  
 Dar-es-Salaam, 245.  
 Darfur, 233, 237  
 Daria, R., 220  
 Daniel Pass, 42.  
 Darjiling, 2, 201, 204.  
 Darlington, 34.  
 Darmstadt, 74, 75.  
 Darwin, 37  
 Darwin, Port, 259  
*Dates*, 190, 192, 194,  
     231, 235, 239, 240.  
 Davenport, 137.

- Dawson, 128.  
 Dayton, 143  
 Dead Sea, 192.  
*Deals*, 60.  
 Debreczin, 79  
 Dedeagach, 100  
 Delagosa B., 246  
 Delaware, R., 142, 147.  
 Delft, 59  
 Delhi, 198, 200, 203  
 Deli, 223  
 Demerara, 181, 182  
 Denain, 49  
 Denbigh, 29  
 Derby, 28, 29, 35, 38  
 Deseronto, 124.  
 Detroit, 143.  
 Deventer, 58.  
 Diabekr, 191  
 Diamantina, 10, 181  
*Diamonds*, 169, 181, 233.  
 Dibrugarh, 201  
 Diego Garcia, 21, 205  
 Diego Suarez, 255  
 Dieppe, 47.  
 Dindigal, 203.  
 Dobruja, 101  
 Dogger Bank, 23, 30, 32.  
 Dolhain, 54.  
 Dolo, 243  
 Dolnja Tuzla, 81  
 Dominica, I., 158, 163.  
 Dominican Rep., 161.  
 Doncaster, 35  
*Donkeys*, 46, 89  
 Dordogne, R., 52.  
 Dordrecht, 59  
 Dortmund, 74.  
 Dovrefield Mts., 60.  
*Down*, 63  
 Draken-Berge, 226  
 Drammen, 60  
 Dresden, 46, 75, 76.  
 Droitwich, 10.  
*Drugs*, 75, 172, 174,  
 194, 195, 201, 206,  
 209, 213-5, 218, etc.  
 Dublin, 32, 40  
 Dussburg, 74.  
 Dulouque, 137  
 Duluth, 109, 135, 144  
 Dumbarton, 10, 34.  
 Dundas, 258, 263  
 Dundee (U K.), 38  
 Dundee (S.A.), 254.  
 Dunedin, 267.  
 Dunfermline, 38.  
 Dunkirk, 47, 50  
 Durango, 152, 153  
 Durban, 11, 250, 253  
 Durnford, Port, 254.  
 Dusseldorf, 71, 74  
*Dyes*, 75, 100, 145,  
 155-71, 160-3, 189,  
 195, 201, 235, 241  
 Dzungaria, 217  
 East London, 250.  
 Eastport, 128, 144.  
 Ebro, R., 17, 94.  
 Echigo, 210  
 Echuca, 262, 265  
 Ecuador, 16, 171, 172  
 Edam, 58  
 Edinburgh, 10, 37, 40  
 Edmonton, 106, 122,  
 125, 127, 129  
 Eger Pass, 81, 83  
*Eggs*, 48, 55, 61, 69,  
 80, 88, 89, 128, 149.  
 Egypt, 4, 228, 237  
 Eisenerz, 82  
 Ekaterinoslav, 68.  
 Elandsfontein, 250  
 Elandslaagte, 254  
 Elba I., 91  
 Elbe R., 72, 74, 78.  
 El Benadar, 244.  
 El Obeid, 237  
 El Yemen, 193  
 Elberfeld, 71, 75.  
 Elbeuf, 48, 50  
 Elburz Mts., 186, 194.  
 Elche, 96  
 Elizabeth, Port, 250.  
 Elswick, 34  
 Emden, 70.  
 Encarnacion, 179  
 Encoje, 243.  
 Entre Rios, 178.  
 Epervay, 45, 48.  
 Erfurt, 72  
 Erie, L., 105, 109, 115  
 Eritrea, 244  
 Erivan, 68, 69  
 Erlau, 81  
 Erz Gebirge, 75, 76, 82  
 Erzerum, 190, 194.  
 Escanaba, 139.  
 Eskilstuna, 62.  
*Esparto=alfa*,  
 Esperance Bay, 258  
 Esquimalt, 11, 120  
 Essen, 54, 75  
 Esthonia, 69.  
 Eten, 173.  
 Euboea, 99.  
*Eucalyptus*, 261  
 Euphrates, R., 187.  
 Evans Pass, 107.  
 Faenza, 91.  
 Fahlun, 62  
 Faizabad, 201.  
 Fall River, 141.  
 Famagusta, 190.  
 Farafrah, 237  
 Faroe Is., 63  
 Fashoda, 237.  
 Fayum, 238  
*Feathers*, 60, 63, 233,  
 235, 240, 252, 269  
 Ferghana, 220.  
 Ferrajo, 90  
 Ferrara, 88.  
 Ferrol, 93, 97.  
 Festiniog, 40.  
 Fez, 235.  
 Ferzan, 240  
*Fibres*, 15, 17, 33, 37,  
 45, 113, 189, 220,  
 232, 263, 267.  
 Fifield, 264  
 Fiji Is., 268  
 Findon, 30  
 Finland, 12, 68, 69  
*Fish*, 13, 30, 46, 117,  
 169, 209, 214, 219,  
 243, 265  
 Fiume, 21, 81.  
 Fives, 51  
*Flax*, 15, 38, 45, 49,  
 54, 59, 67, 74, 85, 89,  
 137, 178, 200, 267.  
 Florence, 88, 89, 91, 92.  
 Flushing, 57.  
 Fo-kien, 216  
 Fonseca, G., 157.  
 Fontenoy, 4, 54  
 Forfar, 38  
 Formosa, I., 208-210.  
 Fortune Bay, 131  
 Fo-yang, L., 212  
 Frankfurt (Main), 77.  
 Frankfurt (Oder), 72.

- Franklin, 146  
 Fraser R., 122, 123  
 Fray Bentos, 12, 179  
 Fredericton, 124, 129  
 Frederikstad, 00  
 Freetown, 242  
 Freemantle, 259  
 Freiburg, 74  
 Fribourg, 86  
*Fruit*, 27, 38, 45, 67,  
     81, 89, 113, 114, 132,  
     155, 159, 161, 162,  
     170, 175, 180, 189,  
     214, 220, 231, 256,  
     262, 265, 268.  
 Fu-chou, 216  
 Fuji-san, Mt., 208  
 Fukushima, 210  
 Fukuyama, 210  
 Funchal, 256  
 Fundy, Bay, 119, 129  
*Fur*, 61, 67, 76, 117,  
     122, 219  
 Furth, 73, 77.  
 Fusan, 218  
*Fustic*, 155, 157, 160.  
  
 Gafsa, 236  
 Galashiels, 36  
 Galatz, 21, 99, 100  
 Galla, 244  
 Galle, 205  
 Gallipoli, 89, 100  
 Galveston, 19, 111  
 Ganges, R., 3, 198  
 Garonne, R., 48, 49, 51  
*Gas*, 37, 115, 127  
 Gaya, 201  
 Geelong, 264.  
 Gefle, 61, 62.  
 Gellivara, 62  
 Geneva, 4, 86  
 Genoa, 21, 22, 42, 91.  
 Georgetown, 181, 256  
 Geraldton, 259, 263  
 Geron, 95, 96  
 Gez, 194.  
 Ghadames, 236  
 Gharian, 236  
 Ghat, 236, 241  
 Ghats, Mts., 196-201.  
 Ghazipur, 201  
 Ghent, 53, 54, 55  
 Gibara, 160.  
 Gibraltar, 11, 21, 93  
  
 Gijon, 93, 96.  
*Gin*, 17, 58.  
*Ginger*, 159.  
 Girin, 217  
 Gurgenti, 90.  
 Gironde, R., 47, 49  
 Gisborne, 266  
 Gladbach, 75  
 Gladstone, 139.  
 Glarus, 86.  
 Glasgow, 7, 19, 28, 32,  
     34, 37, 172  
*Glass*, 37, 52, 54, 75,  
     81, 90, 140, 145.  
 Gloucester (U K.), 35.  
 Glo'ster (U S A.), 147.  
 Gloversville, 141.  
 Goalpara, 201  
 Gobi Desert, 186, 217  
 Godaveri, R., 199.  
*Gold*, 46, 116, 169, 189,  
     221, 233, 263, 267  
 Gold Coast, 233.  
 Goletta, 236  
 Gondar, 244  
 Good Hope, C., 225.  
 Goole, 24  
 Gorlitz, 73.  
 Goteburg, 61, 62  
 Gotha, 75  
 Gouda, 58, 59.  
 Goyaz, 181  
 Graaf Reinet, 252  
 Grafton, 264  
 Graham's Town, 252  
 Granada (Sp.), 95.  
 Granada (Nic.), 157  
 Grand Mere, 124  
 Grand Rapids, 143  
*Granite*, 28, 40, 146.  
 Grantham, 35  
*Graphite*, 77, 82, 205,  
     221.  
*Grass*, 10, 82, 83  
 Great Atlas, 234, 235.  
 Great Bight, 256  
 Great Karroo, 251  
 Gt Namaqualand, 248  
 Great Salt Lake, 107.  
 Greenbushes, 264  
 Greenland, 63  
 Greenock, 37.  
 Grenada, 159  
 Grenoble, 51  
 Greymouth, 267.  
  
 Greyton, 254.  
 Greytown, 157.  
 Grimsby, 30  
*Grindstones*, 35, 52  
 Griqualand, W., 253  
 Grisons, 85  
 Groningen, 58.  
 Grosseto, 88.  
 Gruyère, 85  
 Guadalajara, 153  
 Guadalquivir, R., 93.  
 Guadeloupe, 1., 162  
 Guanajuato, 152  
 Guatemala, 117, 155.  
 Guayaquil, 172  
 Guaymas, 150, 152  
 Guana, 165, 181.  
 Guenne, 48  
 Guinea, Gulf, 225, 242  
 Gulf Stream, 7, 44, 104,  
     106, 109, 114, 131,  
     132, 162  
*Gum*, 21, 231, 240,  
     261, 267.  
*Guttapercha*, 18, 223.  
 Gwalior, 201.  
 Gympie, 263  
*Gypsum*, 40, 145.  
  
 Haarlem, 59.  
 Hagen, 75.  
 Haidarabad, 201, 203  
 Haifa, 192  
 Hainan, 189, 214  
 Hainault, 55  
 Haiphong, 207.  
 Haiti, 104, 160, 161.  
 Hakodate, 210  
 Halifax (U K.), 36  
 Halifax (N S.), 118, 119  
 Halle, 74, 76  
 Hall's Creek, 263.  
 Hamada, 209  
 Hamah, 192  
 Hamburg, 70, 72, 76  
 Hamilton, 119, 126  
     127, 130  
 Hammerfest, 60  
 Hang-Chau, 215, 216  
 Hangö, 65.  
 Han-hai, 186  
 Hankow, 215, 216.  
 Hanley, 40  
 Hanoi, 207.  
 Hanover, 73, 75, 77.

- Han-yang, 215.  
 Harar, 244  
 Harbion, 221.  
 Harbour Grace, 131.  
 Hardwar, 199  
 Harrismith, 250  
 Hartford, 141, 144.  
 Hartley Hill, 247  
 Hartlepool, 38.  
 Harwich, 36  
 Harz Mts, 72, 74, 75  
 Havana, 10, 159, 160  
 Haverhill, 143, 147.  
 Havre, 47, 50.  
 Hawick, 36  
 Heidelberg, 249.  
 Heilbronn, 250  
 Helsingborg, 61.  
 Helsingfors, 68.  
*Hemp*, 49, 55, 67, 81,  
 85, 89, 91, 150, 209,  
 220, 222, 247.  
 Heiat, 195  
 Herberton, 259, 263.  
 Hermopolis, 102  
 Hertford, 37, 38.  
 Herzegovina, 81.  
*Hides*, 13, 37, 50, 51,  
 67, 73, 80, 129, 143,  
 153, 155, 179, 220,  
 233, 262, 267  
 Himalaya Mts, 1, 2, 3,  
 186, 197, 199  
 Hindu Kush Mts, 186  
 Hirotsaki, 210  
 Hirschberg, 76.  
 Hobart, 265  
 Hodeida, 192, 193.  
 Hoerde, 74.  
 Hofrat, 237.  
 Hoki, 210  
 Hokituka, 267.  
 Holyhead, 216  
 Holyoke, 143, 147.  
 Holytown, 34  
 Homs, 192  
 Honda, 171  
 Hondo, 208  
 Honduras, 111, 155  
*Honey*, 67, 80, 99, 102,  
 175, 234, 262  
 Hong-Kong, 11, 216  
 Honolulu, 269  
 Honshu, 208-210.
- Hook, The, 57  
*Hops*, 17, 26, 48, 55,  
 73, 80, 83, 125  
 Horn, Cape, 166  
*Horns*, 40  
*Horses*, 30, 46, 47, 55,  
 58, 64, 67, 73, 79, 7  
 95, 125, 129, 136,  
 152, 189, 193, 194,  
 220, 241.  
*Hostery*, 34, 51, 75, 76,  
 141  
 Houghton, 140.  
 Hualgayoc, 173.  
 Huallanca, 173  
 Huancavelica, 173  
 Huanchaco, 173, 174  
 Huaraz, 173  
 Huddersfield, 36  
 Hudson Bay, 104, 111.  
 Hudson River, 109  
 Hué, 207  
 Huelva, 96  
 Hughenden, 262.  
 Hull, 30  
 Humber, R., 24, 32  
 Humboldt Current,  
 168, 175  
 Hunan, L., 212, 214  
 Hupe, 214.  
 Huron, 139  
 Huron, L., 104, 128.  
 Hwangho, R., 212.  
 Hyogo, 211.
- Iceland, 7, 63  
 I-chang, 213, 215.  
 I-chow, 215  
 Idria, 46, 82  
 Idzumi, 210.  
 Ilkestone, 35.  
 Illawarra, 263, 264  
 Iloilo, 222  
 Ilorin, 241  
 Indian Ocean, 205  
 Indianapolis, 138, 143  
*India-rubber*, 152, 156,  
 157, 168, 170, 172,  
 180, 206, 231, 232,  
 242, 246, 255  
*Indigo*, 155, 156, 189,  
 201, 241  
 Indo-China, 206  
 Indus, R., 12, 187, 198  
 Indwe, 252
- Inhambane, 246.  
*Ink* (Indian), 214.  
 Innsbruck, 80, 83.  
 Interlaken, 85  
 Invercargill, 266, 267.  
 Ipswich, 263.  
 Iquique, 175  
 Iquitos, 172  
 Iran Plateau, 186, 194  
 Irawadi, R., 12, 199  
 Irkutsk, 217, 221  
*Iron*, 14, 28, 45, 115,  
 233, etc  
 Ironton, 139  
 Irish, R., 187, 189.  
 Iserlohn, 75  
*Isinglass*, 69  
 Iskanderun, 192.  
 Ismailia, 238  
 Ispahan, 194, 195  
 Ithaca, 144  
*Ivory*, 170, 172, 189,  
 202, 221, 233, 236,  
 240, 243, 244.
- Jabalpur, 204.  
 Jablunka Pass, 42, 78.  
 Jacksonville, 138  
*Jade*, 217.  
 Jaffa, 21, 192 \*  
 Jagersfontein, 250  
 Jaipur, 203.  
 Jamaica, I., 104, 161.  
 Jamestown, 256  
 Jamna, R., 187  
 Java, I., 16, 159, 223.  
 Jeddah, 21, 192  
 Jemmapes, 4, 54.  
 Jerlogubi, 244  
 Jersey City, 147.  
 Jhansi, 201.  
 Jibuti, 244.  
 Jimenez, 152  
 Joachimsthal, 81.  
 Jodhpur, 203.  
 Johannesburg, 10, 249.  
 Johnstone, 141.  
 Jonkoping, 61  
 Juyuy, 174, 177.  
 Julich, 76.  
 Juneau, 128.  
*Jute*, 38, 201.
- Kabin, 206  
 Kabul, 195, 203.



- Kaffa, 244  
 Kagoshima, 210, 211.  
 Kai-tung, 213  
 Kaidalovo, 221.  
 Kaiping, 216  
 Kaira, 201, 203  
 Kairwan, 236  
 Kaisariyeh, 191  
 Kalahari Desert, 248  
 Kalgan, 217  
 Kalgurli, 263  
 Kambombo, 246.  
 Kamchatka, 188  
 Kamerun, 244  
 Kamloops, 128.  
 Kanazawa, 211.  
 Kanchew, 217  
 Kandahar, 195.  
 Kano, 236, 240-242  
*Kaolin*, 29, 46, 75, 83,  
 91, 96, 145, 210, 214  
 Kapunda, 263  
 Karachi, 196, 201  
 Karashar, 217  
 Karatsu, 210  
 Karlovitz, 81  
 Karlsbad, 82, 83  
 Karroo, Great, 251  
 Kasanlik, 99  
 Kashan, 195  
 Kashgar, 217  
 Kashmir, 202, 203, 217  
 Kasongo, 243  
 Kassala, 237, 244  
 Katoomba, 263  
 Katsena, 242  
 Kavar, 239, 240.  
 Kazan, 69  
 Kecskemet, 79  
 Keewatin, 122  
 Keeweenaw, 139  
 Keighley, 36  
 Kelung, 210  
 Keneh, 237  
 Kengan, 220  
 Kennedy, P., 259  
 Kerman, 194, 195.  
 Key West, 146  
 Khabarovsk, 221.  
 Khaibar Pass, 195, 197.  
 Khami, 217.  
 Kharkov, 68, 69  
 Khandesh, 201.  
 Khandwa, 198  
 Khartum, 4, 228, 237.  
 Khavas, 220  
 Kherson, 21, 67, 69  
 Khiva, 220  
 Khoms, 236  
 Khong, 207.  
 Khorasan, 194.  
 Khotan, 217  
 Khulm, 195  
 Kiakhta, 217.  
 Kiang-si, 214  
 Kihonge, 243  
 Kidderminster, 36.  
 Kiel, 32, 70.  
 Kiev, 69  
 Kilmarnock, 36  
 Kimberley, 233, 253  
 Kingston (Jam.), 161  
 Kingston (Ont.), 119  
 Kingtchen, 215  
 Kinzig Pass, 77  
 Kiolen Mts, 60  
 Kirghiz Steppes, 186.  
 Kirin, 210, 217.  
 Kirkcaldy, 38  
 Kishinev, 67  
 Kismayu, 245.  
 Klagenfurt, 83.  
 Klausenburg, 81.  
 Klondyke, 6, 127, 128.  
 Kobdo, 217  
 Kobe-Hyogo, 211  
 Koffyfontein, 250  
 Kohat, 202  
 Kokand, 220  
 Kolar, 203.  
 Kolmai, 75  
 Komati Poort, 250.  
 Konia, 191  
 Konigshutte, 75.  
 Kong, 241  
 Kootenay, 116, 127.  
 Korat Plateau, 206.  
 Korata, 244  
 Korea, 218  
 Korosko, 237.  
 Kosseir, 238  
 Kostroma, 69.  
 Kowloon, 216  
 Krasnovodsk, 219  
 Krasnoyarsk, 220  
 Krefeld, 15, 71, 76.  
 Kremnitz, 82.  
 Kronstadt (S A), 250  
 Kronstadt (Russ), 66  
 Kruman, 81.  
 Kuen-lun Mts, 186.  
 Kufra, 240  
 Kufa, 240, 241.  
 Kulja, 217  
 Kumari, 267.  
 Kumasi, 242  
 Kurile Is., 208  
 Kurna, 192.  
 Kuro-shiwo, 208.  
 Kuruman, 249  
 Kushk, 219, 220.  
 Kus-elji, 101  
 Kwando, 246  
 Kwang-si, 15, 214, 215  
 Kwang-tung, 214, 216  
 Kwei-chou, 214  
 Kwei-lin, 215  
 Kyoto, 208-211  
 Kyushu, 209, 210  
 La Guaira, 183.  
 La Paz, 174  
 La Plata, 167.  
 La Rioja, 178.  
 La Serena, 175  
 Labrador, 104, 130  
 Labuan, 223  
*Lac*, 202, 203  
*Lake*, 34, 38, 51, 54, 75  
*Lacquer*, 209, 210  
 Lado, 237  
 Ladybrand, 250.  
 Ladysmith, 254.  
 Lagos, 242  
 Lahore, 203  
 Lan chow, 215.  
 Landrina, 243.  
 Larissa, 99  
 Larnaka, 190  
 Larut, 206  
 Las Palmas, 256.  
 Latakia, 192  
 Launceston, 265.  
 Laurium, 100  
 Lawrence, 141, 147  
 Le Havre, 10  
*Leather*, 37, 51, 62, 64,  
 67, 69, 76, 80, 86,  
 89, 99, 129, 143, 153,  
 155, 174, 176, 179,  
 180, 182, 195, 203,  
 220, 234, 235, 252,  
 264, 267  
 Leadville, 10, 139, 140  
 Lebu, 176

- Lechlade, 25  
 Leeds, 24, 36, 44.  
 Leek, 28  
 Leighorn, 89, 90, 91, 92.  
 Leh, 218  
 Leicester, 30, 36, 37.  
 Leipzig, 73, 75, 76  
 Lemberg, 81  
*Lemons*, 45, 48, 89, 96.  
 Leon, 153, 155  
 Léon, 157  
 Leopoldville, 227, 243  
 Lethbridge, 127.  
 Levis, 119  
 Levuka, 268  
 Leyden, 59.  
 Lhasa, 218.  
 Libau, 66  
 Libertad, 156  
 Liboko, 243  
 Libreville, 244  
 Libyan Desert, 239.  
 Liège, 54, 55.  
 Liegnitz, 73  
 Lille, 51, 52.  
 Lima, 173.  
 Limburg, 54.  
 Limoges, 46, 52.  
 Limon, 157.  
 Linares, 96  
 Lincoln, 35, 267.  
*Linen*, 15, 33, 39, 50,  
 54, 69, 76, 81, 97  
 Linlithgow, 29  
*Liquorice*, 96, 191  
 Lisbon, 22, 93, 96, 251.  
 Lisburn, 38  
 Lithgow, 263, 264  
 Liverpool, 15, 34, 103  
 Liverpool, East, 140.  
 Livingston, 155  
 Llanberis, 40.  
 Lloro, 171.  
 Loanda, 243  
 Loango, 244  
 Lodz, 68.  
 Lofoten Is., 60.  
 Logrono, 94  
*Logwood*, 151, 155, 161,  
 163  
 Loire, R., 48, 49  
 Lombok Is., 222  
 London (N A.), 127,  
 130  
 London (U K.), 24-40  
 Londonderry, 127  
 Long Island, 144, 146  
 Lorenzo Marquez, 246  
 Los Angeles, 137  
 Louisville, 109, 114  
 Louvain, 55  
 Lowell, 111, 141, 147  
 Lowestoft, 30  
 Lubeck, 70  
 Lucca, 89, 90  
 Lucknow, 201-204  
 Ludhiana, 203  
 Ludwigshafen, 75.  
 Lulea, R., 62  
 Lunenburg, 123  
 Lurgan, 38  
 Luton, 38  
 Luxemburg, 49, 74, 77.  
 Luzon, I., 222  
 Lydenburg, 249  
 Lyell, 265, 267  
 Lyme Regis, 40  
 Lynchburg, 146  
 Lynn, 143, 147  
 Lyons, 4, 15, 48, 51.  
 Lyttelton, Port, 266  
 Maas, R., 52, 57, 76  
 Macao, 216,  
*Macaroni*, 50, 89  
 Macassar, 222, 223  
 Macclesfield, 38  
 Mackay, 263, 264  
 Mackeesport, 142  
 Mackenzie, R., 121  
 MacLoutsie, 247  
 Macquarie, 265  
 Madagascar, I., 255  
 Madeira, Is., 93, 256  
 Madeira, R., 166, 167  
 Madras, 12, 197-204  
 Madrid, 94, 97.  
 Madura, 223  
 Mafeking, 249  
 Magadova, 244  
 Magdalena, R., 171  
 Magdeburg, 73, 74, 77  
 Magnesia, 191  
 Mahé, 256  
 Mahebourg, 256  
*Mahogany*, 151, 155,  
 160, 161  
 Mahon, 93  
 Maidstone, 37  
 Mainachin, 217.  
 Main, R., 71, 72, 77.  
 Mainz, 71  
 Maitland, 264  
*Maise*, 12, 48, 67, 69,  
 80, 89, 96, 99, 125,  
 135, 177, 232, 263,  
 Makalla, 193  
 Makri, 190  
 Malabar, 201, 202.  
 Malacca, 206  
 Malaga, 21, 95, 96.  
 Malindi, 245  
 Malmo, 61  
 Maloggia, 84  
 Malta, I., 21, 45  
 Managua, 155, 157.  
 Manaos, 180  
 Manch Chunk, 158  
 Manchester (U K.), 15,  
 19, 25, 34  
 Manchester (U S.A.),  
 141  
 Manchuna, 216.  
 Mandalay, 199  
*Manganesa*, 139, 160,  
 181, etc  
 Manila, 17, 19, 222.  
*Manila hemp*, 222.  
 Manissa, 191  
 Mannheim, 71.  
 Manta, 172  
 Mantua, 91  
 Manukau, 266  
 Manzanilla, 150.  
 Maracaibo, 182  
 Maranhão, 180  
 Marañon, R., 167  
*Marble*, 28, 54, 146  
 Marble Bar, 263.  
 Marburg, 79  
*Margarine*, 13, 58.  
 Margelan, 220  
 Maria Theresiopol, 79  
 Marietta, 139  
 Maritza, R., 98, 100.  
 Marlborough, 267.  
 Marmance, 190  
 Marocco, 234, 235  
 Marquette, 115, 139  
 Marsala, 89  
 Marseilles, 21, 47-52.  
 Masaya, 157.  
 Mascara, 235  
 Mascarenhas, 255  
 Mashad, 194, 195,

Mashonaland, 246.  
 Massa, 90  
 Massowa, 237, 244.  
*Mastic*, 190  
 Masulipatam, 197, 201.  
 Matadi, 243  
 Matanzas, 161  
*Maté*, 179  
 Matsuyama, 211.  
 Maturin, 183  
 Maulmein, 206  
 Mauritius, I, 250, 255  
 Mayaguez, 162.  
 Maybole, 37  
 Mazagan, 235  
 Mazatlan, 150.  
*Meat*, 12, 29, 55, 129,  
 136, 177, 179, 181,  
 262, 266, etc  
 Mecca, 192, 193.  
 Mechlin, 54.  
 Medellin, 171.  
 Medina, 192.  
 Medoc, 48.  
 Meerut, 203.  
 Meissen, 75.  
 Mekong, R., 206, 207  
 Melanesia, 268  
 Melbourne, 259, 264  
 Merton Mowbray, 30  
 Memphis, 138, 143  
 Menam, R., 12, 206.  
 Mendoza, 178  
 Mequenez, 235  
 Mercedes, 178  
*Mercury*, 46, 116, 221  
 Merida, 150, 182  
 Meriden, 144  
 Mersey, R., 23, 32, 34.  
 Mersina, 190  
 Merthyr Tydfil, 35.  
 Merv, 219, 220  
 Mesopotamia, 186, 191  
 Messina, 21, 89, 92  
 Mexico, 150, 153  
 Mexico, Gulf, 104, 160.  
 Michigan, L., 105, 148  
 Micronesia, 268.  
 Middleburg, 249  
 Middlesborough, 34  
 Milan, 88, 89, 90, 91.  
 Mildura, 262  
*Milk*, 25, 202, etc Cf.  
*butter, cheese*  
*Millet*, 200, 241.

Milwaukee, 135, 143.  
 Minas Geraes, 181  
 Minneapolis, 143, 144  
 Mirzapur, 203  
 Misrata, 236.  
 Missiones, 177.  
 Mississippi R., 108  
 Missouri R., 108  
 Mogador, 235  
*Mohair*, 191, 195, 202,  
 252, 254  
 Mohammara, 194  
 Mohawk, R., 109, 147.  
 Mojanga, 255  
 Moji, 210, 211.  
 Moldavia, 100  
 Moldau, R., 44, 72, 83.  
 Mollendo, 173.  
 Molteno, 252  
 Molucca, Is., 223  
 Mombasa, 230, 245  
 Monastir, 99.  
 Mongolia, 217, 238  
 Mons, 4, 54.  
 Montego, 161.  
 Montenegro, 99, 102  
 Montevideo, 22, 179  
 Montgomery, 144  
 Montreal, 119, 121.  
 Montrose, 38  
 Montserrat, I., 159.  
 Moonta, 236.  
 Mooroopna, 262  
 Moose Factory, 122  
 Morava, R., 77, 98-102  
 Moravian Gate, 78.  
 Morea, 99.  
 Moresnet, 54.  
 Moscow, 7, 10, 68, 69.  
 Mossamedes, 243  
 Mossel Bay, 250  
 Mostaganem, 235.  
 Mostar, 79  
 Mosul, 191.  
 Motherwell, 34  
 Mozambique, 246.  
 Mpwapwa, 245.  
 Mukden, 216.  
 Mulhausen, 71, 75  
 Mulheim, 74.  
 Multan, 201, 203  
 Munich, 74, 76.  
 Munster, 71  
 Murcia, 95, 96  
 Muroran, 210, 211.

Murshidabad, 203.  
 Murzuk, 236  
 Muscat, 193  
 Muskegon, 144.  
*Mustard*, 38.  
 Muza, 171  
 Mylau, 83  
 Mysore, 197, 200-203.  
 Nagasaki, 21, 209, 219  
 Nagoya, 210, 211.  
*Nails*, 35, 54.  
 Nakatsu, 210, 211.  
 Namaqualand, 253.  
 Namur, 54.  
 Nanaimo, 120, 126.  
 Nancy, 49, 51.  
 Nanking, 215.  
 Nantes, 47.  
 Nantwich, 10.  
 Napier, 266, 267  
 Naples, 2, 21, 88, 91  
 Narbada, R., 198, 199  
 Nashua, 141  
 Nassau, 162  
 Natal, 233, 253.  
 Naugatuck, R., 144  
 Nauta, 167, 172  
 Neckar, R., 71, 73  
*Needles*, 35, 75.  
 Negropont, 99  
 Nejd, 193  
 Nelson (B N A.), 119  
 Nelson (N Z.), 268  
 Nerchinsk, 221.  
 Neuss, 76  
 Nevers, 48.  
 New Almaden, 140  
 New Amsterdam, 181  
 New Antwerp, 243.  
 New Bedford, 141  
 New Caledonia, 268.  
 New Forest, 27.  
 New Glasgow, 127.  
 New Haven, 144.  
 New Hebrides, 286.  
 New Guinea, 259, 268.  
 New Orleans, 22, 146.  
 New Plymouth, 266  
 New Westminster, 120.  
 New York, 22, 106, 146.  
 Newbern, 144  
 Newcastle (Nat.), 254  
 „ (N S W.), 260, 263.  
 „ (U K.), 29, 34, 37.

- Newchwang, 216.  
 Newfoundland, 13, 130  
 Newport, 34  
 Newport News, 142  
 Ngami, L, 230, 248  
 Nganhwei, 214.  
 Niagara, 3, 105, 109  
 Nicaragua, 111, 157  
 Nicholson, Port, 268  
*Nickel*, 128, 268  
 Nicolaiev, 67, 69  
 Niemen, 71  
 Niger, R, 229, 241, 242  
 Nugata, 208, 211  
 Nutsu, 210  
 Nikko, 209.  
 Nile, R., 4, 228, 232, 236.  
 Nilgiri Mts., 198, 201.  
 Nineveh, 191.  
 Ning-po, 215, 216.  
 Nish, 101  
 Nishapur, 195.  
 Nkata-Bay, 247.  
 Nolloth, 253  
 Norfolk, 106, 144.  
 Norrköping, 62  
 North Attleboro, 145  
 Northampton, 37, 264  
 Northumberland S. 126  
 Northwich, 10.  
 Norwich, 10, 38  
 Noshiro, 211  
 Notre Dame Bay, 131  
 Nottingham, 34  
 Nou, I, 268  
 Noumea, 268.  
 Novara, 91  
 Nullagine, 263.  
 Nurnberg, 72, 75, 77.  
*Nutmeg*, 205, 223.  
 Nutrias, 182.  
 Nyangwe, 227, 243  
 Nyassa, L., 226, 230  
 Nymagee, 264.  
 Oahu, 269.  
 Oamaru, 266  
*Oats*, 26, 45, 55, 61, 64,  
 66, 80, 125, 136, 267  
 Oaxaca, 152, 153  
 Ob, R, 12, 220, 221.  
 Obama, 210  
 Obidos, 167, 180.  
 Odense, 64  
 Oder, R, 71-75.  
 Odessa, 21, 65, 67, 69  
 Ofoten, 61, 62  
 Ogden, 146.  
 Ohio, R., 109  
*Oil*, 14, 29, 46, 48, 55,  
 59, 68, 74, 89, 96,  
 115, 183, 189, 200,  
 231-6, 243, 246.  
 Oil City, 139  
 Okayama, 210  
 Okhotsk Sea, 185.  
 Oldham, 34.  
 Omaha, 136, 140-143.  
 Oman, 193.  
 Omdurman, 4.  
 Oneida, 145  
*Onions*, 95, 132, 238  
 Onomichi, 210.  
 Ontario, L, 104, 127.  
 Ookiep, 253  
*Opium*, 99, 191, 194,  
 201, 213, 214.  
 Oporto, 93, 96.  
 Oran, 235, 236.  
 Orange River, 249, 251.  
 Orange River Col., 249  
*Oranges*, 45, 48, 89, 95,  
 100, 137, 159, 161,  
 180, 191, 192, 214,  
 234, 262.  
 Orangeville, 130.  
 Orinoco, R, 167, 182.  
 Oristano, G, 88  
 Orizaba, Mt., 151.  
 Orsova, 44  
 Oruba, 163  
 Oruro, 174.  
 Osaka, 210, 211.  
 Ostend, 46, 53  
*Ostriches*, 232-5, 252.  
 Oswego, 138.  
 Otago, 267.  
 Otranto, 89.  
 Ottawa, 3, 119, 124.  
 Otyimbingue, 248.  
 Oudtshoorn, 252.  
 Ouro Preto, 181.  
 Outram, 267.  
 Oviedo, 96  
 Owen Sound, 119, 125  
*Oysters*, 13, 30, 46, 117,  
 160, 183, 205, 223,  
 259, 268.  
 Paarl, 251.  
 Padang, 223.  
 Pago-Pago, 268.  
 Paisley, 34  
 Palembang, 223.  
 Palermo, 21, 92  
 Palestine, 195.  
 Palk Strait, 205.  
*Palm*, 159, 183, 189,  
 202, 231, 232, 268  
 Palmas, Las, 256.  
 Palmerston, 259  
 Pamir Mts, 185, 186  
 Pampa, 165, 166, 177.  
 Panama, 19, 22, 171.  
 Panay, 222  
*Paper*, 37, 49, 60, 62,  
 67, 81, 82, 143, etc  
 Papua, 268  
 Para, 22, 180  
 Parahiba, 180.  
 Paraguari, 180.  
 Paraguay, R, 167, 179  
 Paramaribo, 182  
 Parana, R., 167, 179  
 Paranaqua, 181  
 Para Gulf, 162  
 Paris, 22, 50, 51, 52.  
 Parma, 89, 91  
 Paros, 100  
 Parramatta, 264.  
 Pasco, 173  
 Paspebiac, 118.  
 Passau, 72, 77  
 Patagonia, 166, 178  
 Paterson, 15, 141, 142.  
 Patna, 201, 203  
 Patras, 21, 99, 102.  
 Pauillac, 47  
 Paumotu, 269  
 Paysandu, 12, 179  
 Payta, 173  
*Pearl*, 183, 193, 205,  
 223, 259, 268.  
*Pears*, 27, 126, 137,  
 265  
 Pe-chi-li, G, 213  
 Peking, 212, 214-217.  
 Peling Mts, 212  
 Pemba, I, 245  
 Penang, I, 206  
 Penicuk, 37  
 Pennine Mts, 32-38.  
*Pens*, 28, 35  
 Pensacola, 22, 138  
 Pentland Hills, 105

*Pepper*, 182, 189, 201,  
 206, 207, 223  
*Perak*, 206  
*Perche*, 48  
*Periqueux*, 52  
*Perim*, I, 21, 193.  
*Perm*, 41, 66, 68.  
*Perpignan*, 42  
*Persia*, 194  
*Persia*, G, 185, 193  
*Perth*, 259, 262  
*Perth Amboy*, 145  
*Peru*, 36, 174.  
*Peruvian bark* = cin-  
 chona  
*Peshawar*, 10, 203  
*Peterhead*, 30, 40  
*Petersburg*, 146  
*Petroleum*, 14, 29, 46,  
 115, 127, 139, 153,  
 189  
*Petrolia*, 116, 127  
*Petropavlovsk*, 68  
*Philadelphia*, 106, 138-  
 148  
*Philippeville*, 235, 236  
*Philippine Is*, 222  
*Philippopolis*, 102.  
*Phormium*, 267  
*Piacenza*, 88, 91.  
*Pictou*, 118, 126  
*Piedmont*, 88, 89, 91.  
*Pietermantsburg*, 254.  
*Pilbarra*, 263  
*Pilsen*, 44, 80, 82, 83  
*Pine Creek*, 259  
*Pinerola*, 91  
*Pins*, 28, 35  
*Piombino*, 92.  
*Piræus*, 21.  
*Pisa*, 91, 92  
*Pisco*, 173  
*Pittsburg* 138-145.  
*Piura*, 173  
*Placentia Bay*, 131.  
*Plate*, R, 165-168.  
*Platinum*, 68, 264.  
*Platten*, See, 79  
*Playa*, 162.  
*Po*, R, 43, 88, 91.  
*Poland*, 38, 67, 69.  
*Ponce*, 162.  
*Pondoland*, 252.  
*Pontianak*, 223.  
*Pontic Mts*, 190, 191.

*Poona*, 203, 204  
*Popocatepetl*, Mt, 151.  
*Porcelain*, 29, 37, 40,  
 46, 52, 75, 82, 91,  
 96, 145, 153, 210,  
 215  
*Pork*, 18, 30, 46, 69,  
 125, 130, 135, 180,  
 etc  
*Port*, 17, 95  
*Port Adelaide*, 258  
*Port Alfred*, 250  
*Port Antonio*, 161  
*Port Augusta*, 258  
*Port Blair*, 205  
*Port Castries*, 163.  
*Port Chalmers*, 267.  
*Port Darwin*, 259  
*Port Elizabeth*, 250.  
*Port Jackson*, 260  
*Port Kennedy*, 259  
*Port Louis*, 256  
*Port Lyttelton*, 267  
*Port Moresby*, 269  
*Port Natal*, 253  
*Port Nolloth*, 253  
*Port of Spain*, 162.  
*Port Philip*, 258, 259.  
*Port Pirie*, 258.  
*Port Royal*, 161  
*Port Said*, 238  
*Port Victoria*, 256.  
*Portalegre*, 96  
*Port-au-Prince*, 161.  
*Portland (Me.)*, 119, 143  
*Portland (Or.)*, 134, 143  
*Porto Alegre*, 181.  
*Port Empedocle*, 90.  
*Portsmouth*, 10.  
*Posen*, 73  
*Potatoes*, 12, 26, 49, 55,  
 59, 61, 67, 73, 80,  
 168, 172, 174, 181.  
*Potomac*, R, 138  
*Potosi*, 174  
*Pottery*, 29, 37, 40, 52,  
 54, 59, 75, 82, 91, 96,  
 145, 153, 180, 210,  
 215  
*Pottsville*, 138  
*Poultry*, 48, 50, 55, 64,  
 69, 80, 89, 128, 149,  
 etc  
*Prague*, 72, 80, 81, 83  
*Pretoria*, 249

*Pribilof Is.*, 117, 122.  
*Pribram*, 82  
*Prince Albert*, 129.  
*Progreso*, 150  
*Providence*, 141, 145.  
*Pruth*, 67  
*Przemysl*, 81.  
*Puebla*, 139, 150, 153.  
*Puerto Barrrios*, 155  
*Puerto Cabello*, 183  
*Puerto Colombia*, 171.  
*Puerto Montt*, 175  
*Puerto Plata*, 161  
*Puerto Principe*, 160  
*Puerto Rico*, 104, 161.  
*Puget Sound*, 134  
*Puna*, 173  
*Pungwe*, R, 246.  
*Puno*, 173  
*Punta Arenas*, 157, 175.  
*Purniah*, 201  
*Pusstas*, 78, 79  
*Pyrenees Mts*, 42, 93.  
  
*Qu'Appelle*, R, 124  
*Quebec*, 119, 124, 129.  
*Quelpart*, I., 218.  
*Queretaro*, 153  
*Quesaltenango*, 155.  
*Quetta*, 196, 204.  
*Quilmane*, 246  
*Quinine* = cinchona.  
*Quito*, 172  
  
*Rabba*, 229, 242.  
*Raheng*, 206.  
*Rassins*, 21, 100, 137,  
 176, 190, 262.  
*Raleigh*, 106  
*Randers*, 64  
*Rangoon*, 199.  
*Raniganj*, 197.  
*Ratibor*, 71.  
*Ratisbon*, 72, 77.  
*Ravenna*, 91.  
*Ravenswood*, 259, 264.  
*Rawal Pindi*, 204.  
*Reading*, 26  
*Recife*, 180  
*Red River*, 106, 124.  
*Red Sea*, 185, 196, 238.  
*Red Tower Pass*, 78.  
*Redditch*, 35  
*Redonda*, 158.  
*Reefton*, 267.

- Reggio, 91.  
 Regina, 129  
 Reichenberg, 80, 83.  
 Reigate, 40  
 Reims, 45, 48, 50.  
 Remscheid, 75.  
 Renmark, 262.  
 Resht, 194  
 Réunion, I, 256  
 Revel, 66, 69  
 Reyes, 174  
 Rhine, R., 43, 44, 57.  
     70-75, 85.  
 Rhodes, I, 190.  
 Rhodesia, 247  
 Rhone, R., 43, 71, 85  
*Rice*, 12, 89, 96, 136,  
     168, 180, 189, 200,  
     206, 207, 209, 213,  
     223, 255  
 Richmond (Nat ), 254  
     " (U S A ), 146.  
 Riga, 66, 69  
 Rio Janeiro, 22, 165  
 Rio Tinto, 96  
 Rivera, 179.  
 Riviera, 7.  
 Rochdale, 34, 36  
 Rochester, 143, 143  
 Rockhampton, 259, 263  
 Rocky Mts, 106-128  
 Roma, 262  
 Rome, 88, 91, 92.  
 Roquefort, 49.  
 Rosario, 178, 179  
*Roses*, 99, 194, 195  
 Rosetta, 238  
 Rossland, 127, 128  
 Rostov, 69  
 Rotherham, 35  
 Rotterdam, 22, 57, 59.  
 Roubaix, 50  
 Rouen, 19, 43, 47, 51.  
 Roxburgh, 267.  
*Rubber* = India-rubber.  
 Ruhr, R., 74, 75.  
 Rumania, 99, 100.  
 Rumelia, 99.  
 Russell, 266  
 Rustchuk, 102  
 Rutherglen, 262  
 Rutland, 146  
*Rye*, 12, 55, 58, 61, 67,  
     73, 80, 136  
 Rylston, 263
- Sabanilla, 171  
 Sacramento, R., 107.  
*Saddlery*, 153, 264  
 Saga, 210  
 Saginaw, 144, 145  
*Sago*, 189, 206, 223  
 Sahara, 231, 238-240  
 Saigon, 207.  
 St Bernard Pass, 84  
 St Brieuc, 47  
 St Denis, 256  
 St Etienne, 49, 51, 52.  
 St Emilion, 48.  
 St Gall, 84, 86.  
 St Gothard Pass, 84.  
 St Helena, 21, 256  
 St. Helens, 28, 29, 37  
 St John, 118  
 St John's, 131.  
 St Lawrence, R., 109  
 St Louis, 22, 144, 148.  
 St Lucia, 163  
 St Luis Potosi, 150.  
 St. Michael, 256  
 St Michael's, 128.  
 St Paul, 144  
 St. Petersburg, 66, 69.  
 St Thomas, I., 163  
 St. Vincent, I., 160  
 St Vincent, G., 258  
 Sakai, 211  
 Sakhalin, I., 189  
 Salamanco, 97  
 Salaverry, 173  
 Saldanha, 250.  
 Sale, 62  
 Salerno, 91  
 Salford, 34.  
 Salina, 145  
 Salinas Bay, 157.  
 Salisbury, 10, 247.  
 Salonica, 21, 22, 98, 100.  
*Salt*, 29, 37, 46, 96,  
     140, 161-3, 169, 189,  
     191, 203, 221, 233,  
     259  
 Salt Lake City, 146  
 Salta, 177  
 Salto, 167, 179.  
 Salzburg, 81  
 Samana Bay, 161.  
 Samar, I., 222  
 Samarang, 223  
 Samarkand, 220.  
 Sambre, R., 53, 54.
- Samoa, Is., 268  
 Samos, 190.  
 Samsun, 190.  
 San Antonio, 152  
 San Diego, 22, 134.  
 San Domingo, 161.  
 San Felipe, 176  
 San Fernando, 162.  
 San Francisco, 134, 149.  
 San José, 155, 157, 179  
 San Juan, 162, 178  
 San Juan, R., 154, 157.  
 San Luis, 178  
 San Luis Potosi, 152  
 San Miguel, 156  
 San Salvador, 155, 156  
 San Sebastian, 93, 96  
 Sandakan, 223  
 Sandfontein, 248,  
 Sandhurst, 263.  
 Sandusky, 139  
 Santa Ana, 155, 156.  
 Santa Cruz, 256  
 Santa Fé, 178  
 Santa Rosa, 179  
 Santander, 93, 171.  
 Santarem, 180  
 Santiago (Chile), 175.  
 Santiago (Cuba), 160.  
 Santos, 22, 181. •  
 São Francisco, R., 166  
 São Paulo, 181.  
 Sapporo, 210  
 Saratov, 67.  
 Sardinia, I., 49, 89, 90  
 Sarnia, 130  
*Sarsaparilla*, 156, 172.  
     182  
 Sault Ste Marie, 105  
 Saumur, 48.  
 Sauterne, 48.  
 Savona, 91  
 Sawakin, 228, 237.  
 Schaffhausen, 86  
 Scheldt, R., 4, 55, 57.  
 Schemnitz, 82  
 Schenectady, 142.  
 Schiedam, 158  
 Schonebeck, 74.  
 Scilly Is, 26  
 Scranton, 138.  
 Scutari, 192  
 Seattle, 22  
 Sebastopol, 65.  
 Sedan, 47, 50.

Seine, R., 43, 48,  
51.  
Sempalatinsk, 220  
Semmering Pass, 78  
Sendai, 210  
Senga, 246.  
Seraing, 54  
Serayevo, 79  
Servia, 84, 99, 101.  
Sestri, 91.  
Seto, 210  
Severn, R., 31, 35  
Seville, 93, 95-97.  
Sèvres, 46, 52  
Sfax, 236  
Shanghai, 21, 215.  
Shansi, 214, 215  
Shan-tung, 214  
Shap, 40  
Shark Bay, 259  
Sharpness, 25  
Shat-el-Arab, 192.  
*Shawls*, 51, 76, 203  
*Sheep*, 15, 29, 46, 117,  
136, 174, 177, 191,  
194, 202, 218, 220,  
232, 262, 265, 266.  
Sheffield, 35  
*Sherry*, 95.  
Shetland Is., 218.  
Shimonoseki, 210.  
Shinano, 210  
Shingle Desert, 167  
*Shipbuilding*, 14, 34,  
91, 148.  
Shipka Pass, 99.  
Shiraz, 194, 195  
Shiré, R., 229, 246.  
Shizuoka, 210  
*Shoes*, 51, 130, 143,  
etc.  
Shumla, 99  
Shuster, 194.  
Siam, 206.  
Siang-tan, 215.  
Siberia, 188, 219-221.  
Sibsagar, 201.  
Sicily, I., 17, 89, 90  
Sidra Gabes, G., 235.  
Sierra Nevada, 94,  
III.  
Sigu, 209.  
Si-kang, R., 212-216.  
Silchar, 201  
Silesia, 73-76, 80-82.

*Silk*, 15, 38, 48, 76, 89,  
100, 141, 191, 195,  
202, 203, 206, 210,  
215, 220  
Sillery, 48  
*Silver*, 46, 116, 156,  
169, 195, 203, 210,  
221, 223, 264.  
Silverton, 10, 258, 264.  
Sirala, 2  
Simon's Bay, 250  
Simplon Pass, 42, 84  
Singapore, 11, 21, 206.  
Sinope, 190  
Sisal, 50  
Sissek, 79.  
Siut, 237  
Skager Rak, 63.  
Skagway, 128.  
Skeena, R., 123  
Skidegate Inlet, 127.  
Skopia, 100  
*Slate*, 29  
Slave Coast, 242.  
Sliven, 99  
Slocan, 128  
Smithfield, 250  
Smyrna, 21, 190, 191.  
Sofala, 246.  
Sofia, 102.  
Sokoto, 241.  
Sokotra, 244.  
Solingen, 75  
Solnhofen, 75  
Somali Penin., 244, 245.  
Sonnenberg, 72, 73.  
Soo Canal, 119.  
Soul, 218  
Sound, The, 63  
Southampton, 10, 33  
Sparrow's Point, 142.  
Spencer G., 258  
Spezzia, 91, 92.  
*Spice*, 159, 189, 205,  
207, 223, 242, 245,  
etc  
Spice Is., 223  
*Spirits*, 17, 26, 49, 55,  
58, 59, 61, 67, 69,  
73, 80, 136, 153,  
159, 161, 177, 180,  
181, 222, 268  
Splitgen Pass, 84  
Srinagar, 203.  
Stanley Falls, 227, 228.

Stanley Pool, 228, 243.  
Stanthorpe, 264  
*Starch*, 12  
Stassfurt, 74.  
Stavanger, 60  
Stellenbosch, 251  
Stettin, 22, 70, 72, 74  
Steyr, 83  
Stilton, 30  
Stirling, 10.  
Stockholm, 2, 62  
*Stockings*=hosiery.  
Stockport, 34  
Stoke, 40.  
Stormont, 128  
Stourbridge, 29, 37.  
Stowell, 265.  
Strassburg, 71-74, 77.  
Strelensk, 221.  
Stroud, 36  
*Sturgeon*, 13, 69.  
Stuttgart, 75.  
Styria, 82  
Suchou, 215  
Süchwan, 124.  
Sucre, 174  
Sudan, 228, 229, 241.  
Sudbury, 128  
Suez Canal, 19, 47,  
87, 91, 121, 185, 238  
*Sugar*, 16, 37, 49, 55,  
61, 67, 69, 73, 80,  
124, 146, 152, 155,  
159, 161, 177, 180,  
181, 222, 237, 244,  
254, 255, 263, 264.  
Sulaga, 241  
Sulaiman Mts., 197.  
Sulina, 21, 101.  
*Sulphur*, 52, 61, 90,  
100, 140, 255, 267  
Sumatra, I., 17, 223.  
Sunderland, 38  
Sungari, R., 217.  
Sunlight, Port, 37  
Superior, L., 5, 104.  
Surabaya, 223  
Surakarta, 223.  
Surinam, 182.  
Susa, 236  
Sutlej, R., 187.  
Suva, 268.  
Swakopmund, 248.  
Swansea, 35.  
Swindon, 35.

Sydney (N S.), 126  
 „ (N S W ), 260, 264.  
 Syme, 190  
 Syra, I, 102  
 Syracuse, 145  
 Syria, 17, 192.  
 Szegedin, 81.

Table Mt., 230.  
 Tabora, 245  
 Tabriz, 194, 195  
 Tachien-lu, 218.  
 Tacoma, 22  
 Tafflet, 240  
 Taganrog, 69  
 Tagus, R, 93, 94.  
 Tahiti, Is., 269.  
 Taipa, I, 216  
 Taipei, 209  
 Tai-yuen, 215.  
 Takasima, 210.  
 Takata, 210.  
 Taku, 216  
 Talca, 176  
 Talcahuano, 176  
 Taltal, 175  
 Tamar, R., 29, 265.  
 Tamarida, 244  
 Tamatave, 230, 255.  
 Tammerfors, 69  
 Tampico, 150  
 Tam-sui, 209  
 Tamworth, 264  
 Tandani, 240, 242.  
 Tanga, 245.  
 Tanganyika, L, 226  
 Tangier, 235.  
 Tanjong Priok, 223  
 Tapioca, 206  
 Tapu, R., 198, 199  
 Taranto, Gulf, 88  
 Tarentum, 140, 145.  
 Tarim Desert, 186, 217  
 Tarragona, 95  
 Tashkent, 219, 220  
 Tasmania, 3, 203, 265.  
 Taungs, 249  
 Taurus, Mts., 186, 190.  
 Tavoy, 206  
 Tay, R, 25, 26, 32  
 Tchukchi, Penin, 185.  
 Tea, 16, 201, 205, 209,  
 214, 254  
 Teak, 202, 206, 207  
 Tees, R., 30, 32, 34

Tegucigalpa, 156  
 Tehama Desert, 193  
 Tehran, 194, 195  
 Tehuantepec Isthm, 150  
 Telegraph Creek, 128.  
 Tell, The, 234, 235  
 Tellicherry, 201  
 Telokbetong, 223  
 Temiscaming, L, 121.  
 Tenasserim, 203  
 Tenduf, 240.  
 Tensift, 235.  
 Terre Haute, 138  
 Tete, 229  
 Terek Davan Pass, 217.  
 Terekti Pass, 217  
 Teutoburger Forest, 73.  
 Tevel, 46.  
 Thames, R, 4, 23-37  
 Thar Desert, 186, 199  
 Tharsis, 96.  
 Theiss, R., 79, 80  
 Thetford, 128  
 Thessaly, 100  
 Thian-Shan Mts., 186.  
*Thread*, 34  
 Thursday, I, 259  
 Thurso, 40  
 Tian-Shan Mts, 217.  
 Tiber, R., 88, 89  
 Tibesti, 239  
 Tibet, 186, 214, 217.  
 Ticonderoga, 140  
 Tien-tsin, 216  
 Tierra del Fuego, 175  
 Tiflis, 10, 68, 69  
 Tigris, R., 187, 191.  
 Tilburg, 59  
 Timaru, 266  
*Timber*, 18, 26, 45, 49,  
 60, 66, 72, 81, 85, 89,  
 113, 123, 143, 151,  
 155, 168, 188, 189,  
 219, 231, 232, 265  
 Timbuktou, 10, 240, 242  
 Timor, 222  
*Tin*, 29, 35, 96, 203,  
 206, 214, 223, 264  
 Titicaca, L, 166, 173  
 Tjilatjap, 223  
 Tlemcen, 235  
*Tobacco*, 17, 49, 59, 67,  
 74, 81, 85, 89, 96, 99,  
 113, 137, 151, 155,  
 159, 168, 192, 194,

201, 215, 220, 222,  
 234, 239, 247, 252.  
 Tobago, 159, 160  
 Tobolsk, 219, 220.  
 Tocantins, R., 180.  
 Togoland, 242.  
 Tokay, 45, 79, 81.  
 Tokyo, 208-211  
 Toledo (Sp), 95-97  
 Toledo (U S A.), 135.  
 Tome, 176  
 Tomsk, 220  
 Tonawanda, 138  
 Tongking, 207  
 Toule Sap, L, 207.  
 Toowoomba, 262  
 Toronto, 119, 130.  
 Toulouse, 50, 51.  
 Tourane, 207  
 Tourcoing, 50.  
 Tournai, 55  
 Tours, 51.  
 Townsville, 259, 263  
 Toyama, B, 209, 211.  
 Trail, 127.  
 Transkei, 252.  
 Transvaal, 249, 253.  
 Trapani, 90  
 Trautenaue, 83.  
 Travancore, 205.  
 Trebizond, 21, 190, 194  
 Trent, R., 26, 32, 40  
 Trenton, 145  
 Treviso, 91  
 Trichinopoly, 201, 203.  
 Trieste, 21, 22, 78, 81.  
 Trincomali, 11, 205  
 Trinidad, I., 159, 162.  
 Trinity Bay, 131  
 Tripoli, 21, 192, 236.  
 Tristan da Cunha, 256  
 Tromso, 60.  
 Trondhjem, 60, 62.  
 Troppau, 80, 83.  
 Troy, 108, 140  
 Troyes, 48  
 Turo, 127  
 Truxillo, 156, 173  
 Tsana, L., 226, 228.  
 Tsi-nan, 215  
 Tsitsihar, 216  
 Tsuruga, 208.  
 Tuat, 240, 242  
 Tucacas, 183  
 Tucuman, 177.



- Tugela, R., 253.  
 Tula, 68.  
 Tulare, R., 137.  
 Tuli, 247.  
 Tundras, 45, 112, 188.  
 Tunga, R., 100.  
 Tunica, 231, 234, 236.  
 Tura, R., 220.  
 Turan, The, 219.  
 Turanian Desert, 189.  
 Turin, 10, 42, 88, 91.  
 Turkey, 36, 45, 100.  
 Turkey in Asia, 15, 26.  
 Turkistan, 217.  
 Turks, Is., 161.  
*Turnips*, 26.  
*Turpentine*, 18, 61, 67, 138.  
 Tuxpan, 153.  
 Tuzla Gol, 191.  
 Twatutia, 209.  
 Two Harbours, 139.  
 Tyne, R., 32, 34.  
 Tyrol, 80, 88.  
 Tyumen, 220.  
 Ueberaba, 181.  
 Ucayali, R., 167, 172.  
 Udinsk, 221.  
 Uganda, 245.  
 Uitenhage, 251, 252.  
 Uji, 245.  
 Uliassatai, 217.  
 Umtali, 246, 247.  
 Ungava, 122, 127.  
 Upsala, 61.  
 Ural Mts., 41, 65, 68.  
 Urga, 217.  
 Uruguay, 167, 179.  
 Urumtsi, 217.  
 Uskub, 99, 100.  
 Uspallata Pass, 176.  
 Usuri, R., 217, 221.  
 Utakamand, 2, 204.  
 Utrecht, 58, 59.  
 Vaal, R., 249, 253.  
 Valдай Hills, 43, 66.  
 Valdavia, 175.  
 Vale of Tempe, 98.  
 Valencia, 21, 95, 97.  
 Valenciennes, 49, 51.  
 Valera, 182.  
 Valladolid, 94, 96.  
 Valmar, 62.  
 Valparaiso, 176.  
 Van, L., 191.  
 Van Reenen Pass, 235.  
 Vancouver, 120, 124.  
 Var, 50.  
 Vardar R., 98, 99, 100.  
 Varillo, 91.  
 Varna, 100, 102.  
 Vegetable Creek, 264.  
 Veraguza, 168, 182.  
 Venne, 10, 46, 91, 92.  
 Vera Cruz, 22, 150.  
 Verkhoyansk, 187.  
 Vermilion, 139.  
 Verviers, 54.  
 Vesuvius, Mt., 91.  
 Victoroy, 181.  
 Victoria (B.C.), 22, 120.  
 Victoria (H.K.), 216.  
 Victoria Falls, 229.  
 Victoria Nyanza, 230.  
 Vienna, 80-83.  
 Villa Rica, 179.  
 Vindhya Mts, 197, 198.  
 Vine, 16, 45, 48, 67, 73, 77, 81, 85, 89, 95, 99, 126, 137, 173, 175, 178, 192, 195, 232, 262.  
 Virgin Is., 163.  
 Vistula, R., 68-72, 79.  
 Vivi, 227, 243.  
 Vladivostok, 217, 221.  
 Volcano I., 90.  
 Volga, R., 12, 66-68.  
 Voltri, 91.  
 Vorosvagas, 82.  
 Vosges, Mts., 71, 74.  
 Vryburg, 248, 249.  
 Vuelta Abajo, 159.  
 Wabana, 131.  
 Wadai, 250.  
 Wadi, 201.  
 Wady Halfa, 237.  
 Waikato, R., 266, 267.  
 Waitemata, 268.  
 Wakamatsu, 210.  
 Wakasa, B., 211.  
 Wakayama, 210.  
 Wallaroo, 263.  
 Wallerawang, 263.  
 Walsall, 35.  
 Walvisch Bay, 11, 248.  
 Wanga, 245.  
 Wanganui, 266.  
 Wapta Pass, 107.  
 Wardha, 201.  
 Warsaw, 66, 68-71.  
 Wash, The, 26, 30.  
*Watches*, 28, 35, 52, 86, 144.  
 Waterville, 141.  
 Waterbury, 144.  
 Wattana, 206.  
 Wattenscheid, 74.  
 Wednesbury, 35.  
 Weimar, 75.  
 Welland Canal, 105.  
 Wellesley, 206.  
 Wellington, 266-268.  
 Welshpool, 25, 36.  
 Werder, 74.  
 Westport, 267.  
 Wetter, 74.  
*Wheat*, 11, 26, 45, 48, 50, 55, 58, 67, 80, 89, 100, 124, 135, 152, 177, 178, 191, 194, 200, 220, 234, 262, 267.  
 Wheeling, 138, 145.  
 White Pass, 128.  
 White Sea, 66, 185.  
 Whitehaven, 28, 33.  
 Whitstable, 30.  
 Wick, 30.  
 Wicklow, 28, 29.  
 Widnes, 87.  
 Wieliczka, 81.  
 Wigan, 33.  
 Wilhelmshaven, 70.  
 Wilkesbarre, 138.  
 Willamette, R., 135.  
 William, Fort, 119.  
 Wilmington, 142, 144.  
 Winburg, 250.  
 Winchester, 16.  
 Windward Is., 162.  
*Wine*, 16, 48, 74, 81, 89, 95, 137, 176, 178, 195, 234, 251, 262.  
 Winnipeg, 10, 122, 125.  
 Winterthur, 86.  
 Winton, 262.  
 Witwatersrand, 249.  
 Witten, 74.  
 Wolverhampton, 35.  
 Wonsam, 218.  
 Woodstock, 40.

- Wool*, 15, 29, 35, 46,  
 50, 54, 58, 64, 68,  
 69, 73, 76, 80, 83,  
 88, 91, 99, 130, 136,  
 141, 169, 171, 174,  
 177, 191, 192, 194,  
 195, 202, 217, 218,  
 220, 233, 235, 249,  
 250, 252, 254, 262,  
 264, 268  
*Worcester*, 37, 40.  
*Wu-chang*, 215.  
*Wynberg*, 251.  
  
*Xalapa*, 152  
*Xeres*, 95, 96  
  
*Yabloni Mts*, 186  
*Yaila Mts*, 66.  
*Yalgeo*, 263  
*Yam Creek*, 259, 263  
*Yale*, 122.  
*Yamague*, 211.  
*Yambo*, 192  
*Yang-tse-kiang*, 212.  
  
*Yanina*, 100.  
*Yarkand*, 217.  
*Yarmouth (U. K.)*, 39,  
 38.  
*Yarmouth (N S.)*, 123  
*Yarra, R.*, 259.  
*Yatung*, 218  
*Yellow R.*, 212.  
*Yellow Sea*, 185.  
*Yemen*, 193.  
*Venesel, R.*, 187, 220  
*Yeovil*, 40  
*Yerba-Maté*, 177, 179.  
*Yezd*, 194  
*Yezo*, 208, 209, 210  
*Yilgarn*, 263.  
*Yoa*, 173.  
*Yodo-gawa*, 211  
*Yokohama*, 21, 211.  
*Yoneko*, 210.  
*Yonezawa*, 210  
*York*, 35  
*Yucatan*, 150-152, 160  
*Yukon, R.*, 116, 127.  
*Yuling Mts.*, 214.  
  
*Yunnan*, 212-216.  
*Yuruari*, 182. ♀  
  
*Zacatecas*, 152, 153  
*Zalatna*, 82.  
*Zambesi, R.*, 229, 245  
*Zamboango*, 222  
*Zamora*, 96  
*Zante, I.*, 99, 100  
*Zanzibar, I.*, 226, 245.  
*Zara*, 81.  
*Zaruma*, 172.  
*Zavia*, 236  
*Zeila*, 244.  
*Zerafshan, R.*, 220.  
*Zimme*, 206  
*Zinc*, 29, 46, 62, 99,  
 140.  
*Zomba*, 246.  
*Zombor*, 81.  
*Zuider Zee*, 57, 58.  
*Zululand*, 253.  
*Zurich*, 85, 86.  
*Zutphen*, 59  
*Zwickau*, 74, 75.